Roads, Streets, &
Indiana Highways

INDIANA HIGHWAY PROGRESS REPORT

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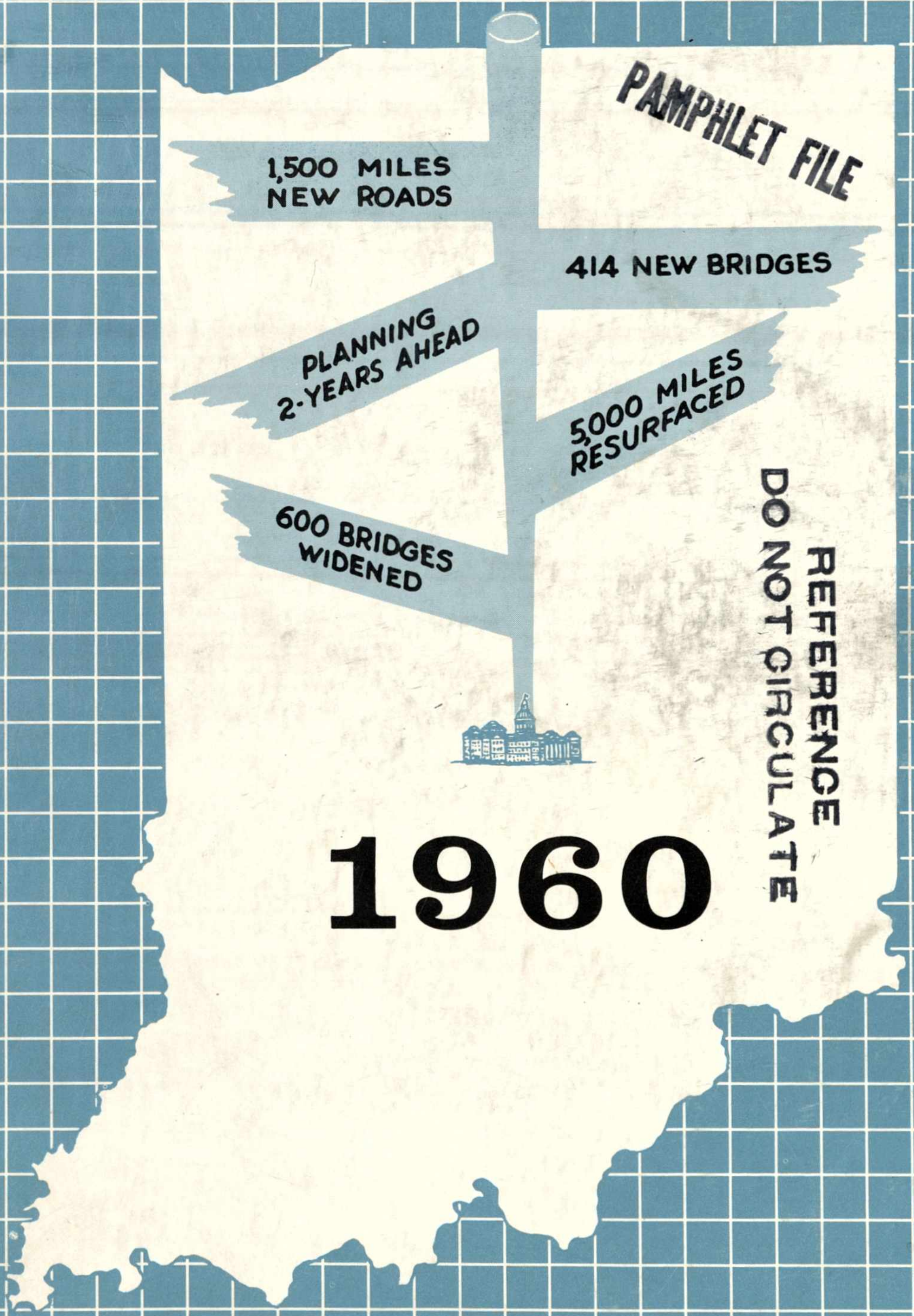

PAMPHLET FILE

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1960

HAROLD W. HANDLEY, Governor

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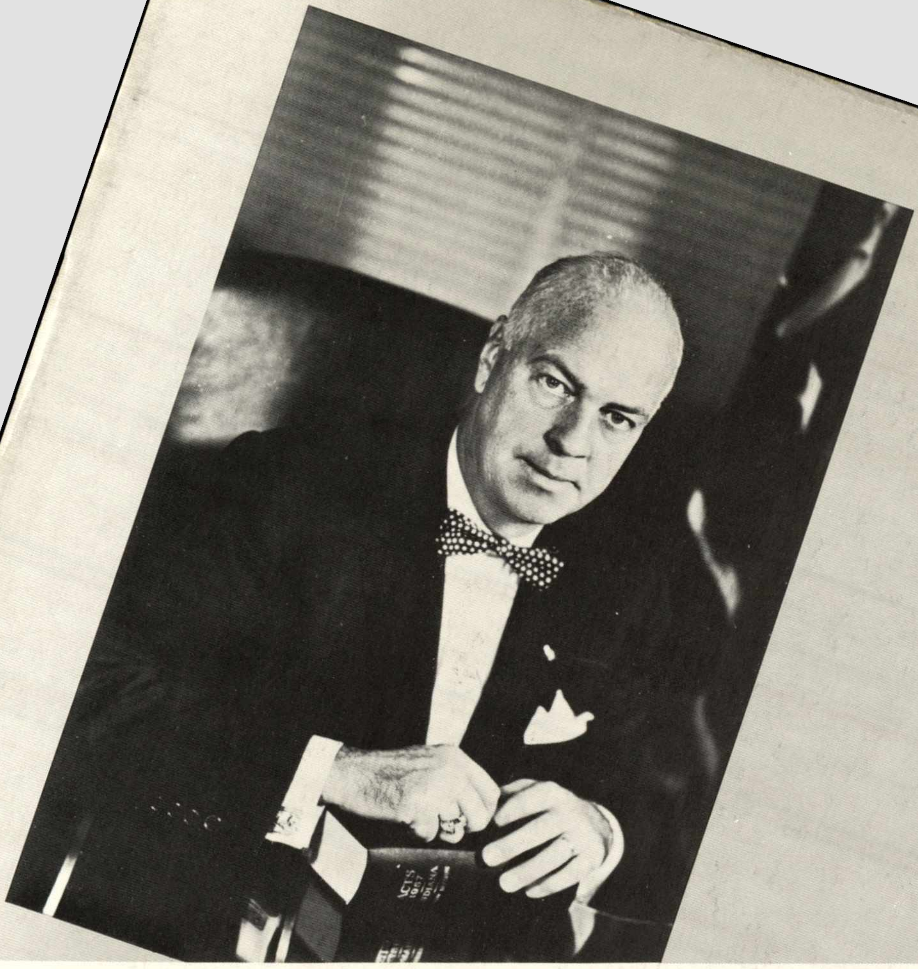


A Note to the Highway Users of Indiana . . .

STATE OF INDIANA
EXECUTIVE DEPARTMENT
INDIANAPOLIS 4

HAROLD W. HANDLEY
GOVERNOR

TO THE PEOPLE OF INDIANA:

Sometimes we in state elective offices are so intent upon our accomplishments that we fail to slow up a little and explain to the people just what we are trying to accomplish. This invariably leads to grave misunderstandings, which not only embarrass the person in office, but have an effect of seriously jeopardizing the progress of the state.

Since assuming the Governor's office in 1957, I have looked with heartfelt pride at the steady advancement Indiana is showing toward becoming a nation wide leadership state. Certainly we Hoosiers can take extreme pride in our inherent ability to recognize a problem, then find the answer. Isn't it also a truism - - and something of a national characteristic - - that we Hoosiers prefer to do the job ourselves?

As my term of office runs through its final year, I feel that we have made great strides in creating an excellent climate for making Indiana a wonderful place to live, work and prosper. This we can tell the businessman, the farmer, the professional man, the factory worker, the tourist, and plain Mr. John Doe on the street. In fact, we can tell the world!

That precisely is what we are doing in this booklet - - entitled "Indiana Highway Report 1960." This alone deals with highways - - one of our most essential of state services.

This is the story of Indiana on rubber tires and the highway system which is helping create a more efficient state in which to do business. It is a report to the taxpayer - - or to be more specific, the highway user - - whose leadership, counsel and patience have helped us give such a glowing account of our highway progress.

Please accept this report as a stockholder in a solvent and successful business enterprise - - your state of Indiana.

Harold W Handley

Harold W. Handley
Governor

A Letter from the Commissioner...

HARRY E. BODINE
member

JOHN PETERS
Chairman

CHARLES M. DAWSON
member

In the vast, complex world of highway development, there is no simple formula which will produce adequate highways for the people of any state. In Indiana, the problem is the same. There is no easy way of doing the job. The difficult procedure of coordinating state resources, revenues, available talent and public acceptance presses the very patience of the state administrator and his staff to such a degree that it is a never ending job of sweat, frustration, tact and just plain work. Such is our plight.

NOW THIS IS OUR RECORD:

On taking office in 1957, we inherited a situation which first required raising additional revenues to make up a deficit of $39½ million in Federal Aid; and second, at the same time preparing a broad State highway improvement program. Immediately we were also confronted with a new problem, the job of instituting the Federal Aid Interstate System, which in bigness challenges the imagination.

In our quest for a sound progressive highway policy the present Commission believes and has steadfastly followed in the theory that a pay-as-you-go financing system is still the most sound and worthwhile approach. Excessive indebtedness is foreign to Hoosier philosophy, and we fail to connect it with any sound business sense. Our feeling is supported even more because since the present Commission assumed office, we have climbed to one of the top ten states in the nation in highway development. Indiana was indeed at a low point three years ago.

Today, we are enjoying an upward movement of progress which we hope will continue for many years into the future. In this report we are relating the story of Indiana's highway problems and their solution since 1957. We hope to give you a vivid picture of the hundreds of miles of roads designed, redesigned, resurfaced and relocated. And also there is a picture of the hundreds of bridges rebuilt—with considerable savings to the highway user. We are also taking you on a tour through the Highway Department and showing you how a highway is built, from the planning stage to the final touches when traffic begins rolling on the finished pavement.

And too, we hope to give you some idea of the immensity of our problems—and just how we go about solving them. Many such problems, by the way, can only be solved through your extensive assistance and cooperation: as a motorist, as a taxpayer, as a property-owner.

As I said before, we stepped into a job which required extensive reorganization of personnel and departments, considerably more policy changes, additional revenues, and a higher level of effort on the part of everyone in Highway. We still are not advanced to the point where any of us can say we are completely satisfied.

Much more needs to be done. But bear with us. We are working on it.

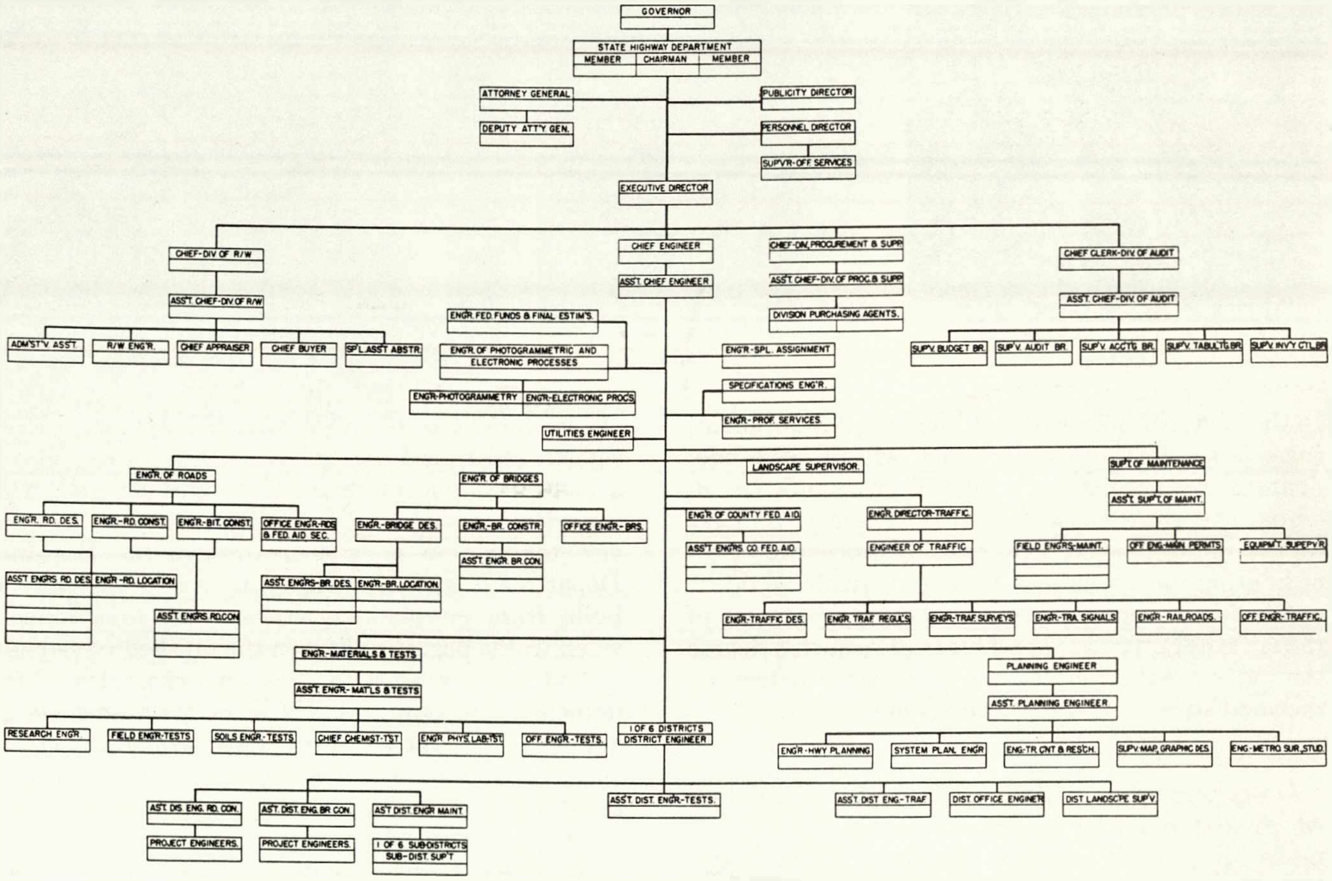
This report covers our work and accomplishments from 1957 to July 1, 1960. In addition we are giving you a picture of what we are planning for the next biennium, July 1, 1960 to July 1, 1962. For the future, we plan to produce an annual report covering every two-year period.

This is our first report to the people. We feel we have a distinct and pleasing story to tell Hoosiers who have so patiently waited for the highways that they are paying for in hard-earned money.

Respectfully,
JOHN PETERS, *Chairman*

ORGANIZATION CHART

Indiana State Highway Department



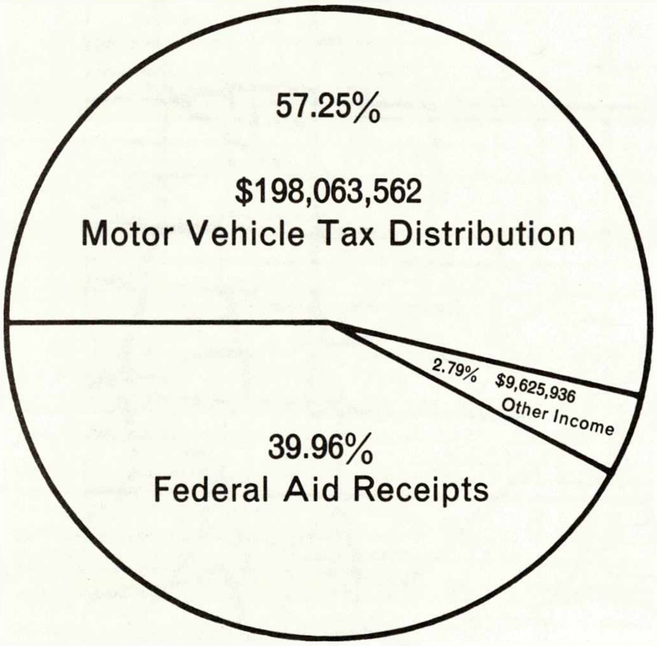
The organization of the Indiana State Highway Department is the result of many years of development and experience in the handling of highway matters in this State with due regard for the statutory provisions affecting the responsibilities that have been defined from time to time as amendments to the original Highway Act. The State Highway Department of Indiana was created by legislative action in 1921.

The organization as evidenced by the organization chart is essentially a combination of line-and-staff authority. Primarily its activities are centered in the Governor and his appointed Highway Commission. This full-time Commission acts upon all matters of policy and certain administrative practices. The detailed administration is carried on thru the line channels of authority to the various bureaus or divisions into which the activities of the Department are divided.

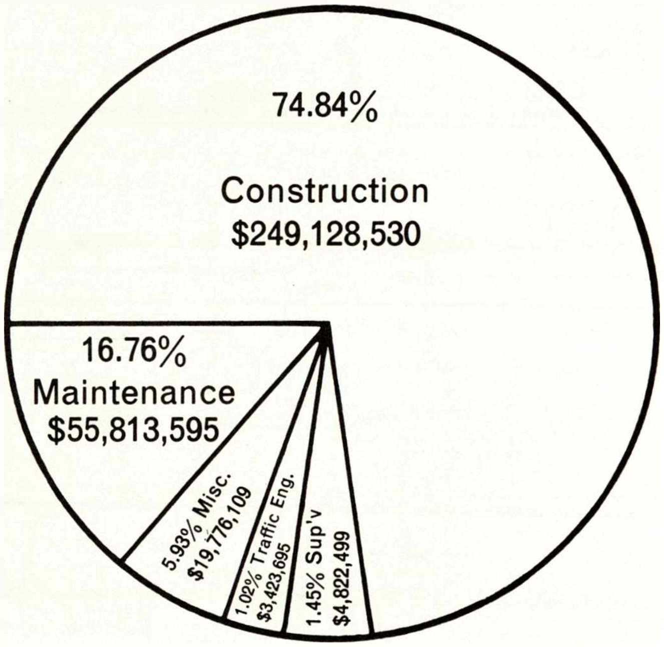
It is essentially a strong central organization with responsibilities for carrying out the detail operations handled thru the District Offices. The State is divided into 6 districts and for purposes of adequate maintenance control each of these districts is divided into 6 sub-districts. There are approximately 11,000 miles of highways in the State of Indiana under the control and supervision of the State Highway Department.

INCOME and EXPENDITURES

January 1, 1957 to June 30, 1960



INCOME
$345,928,241



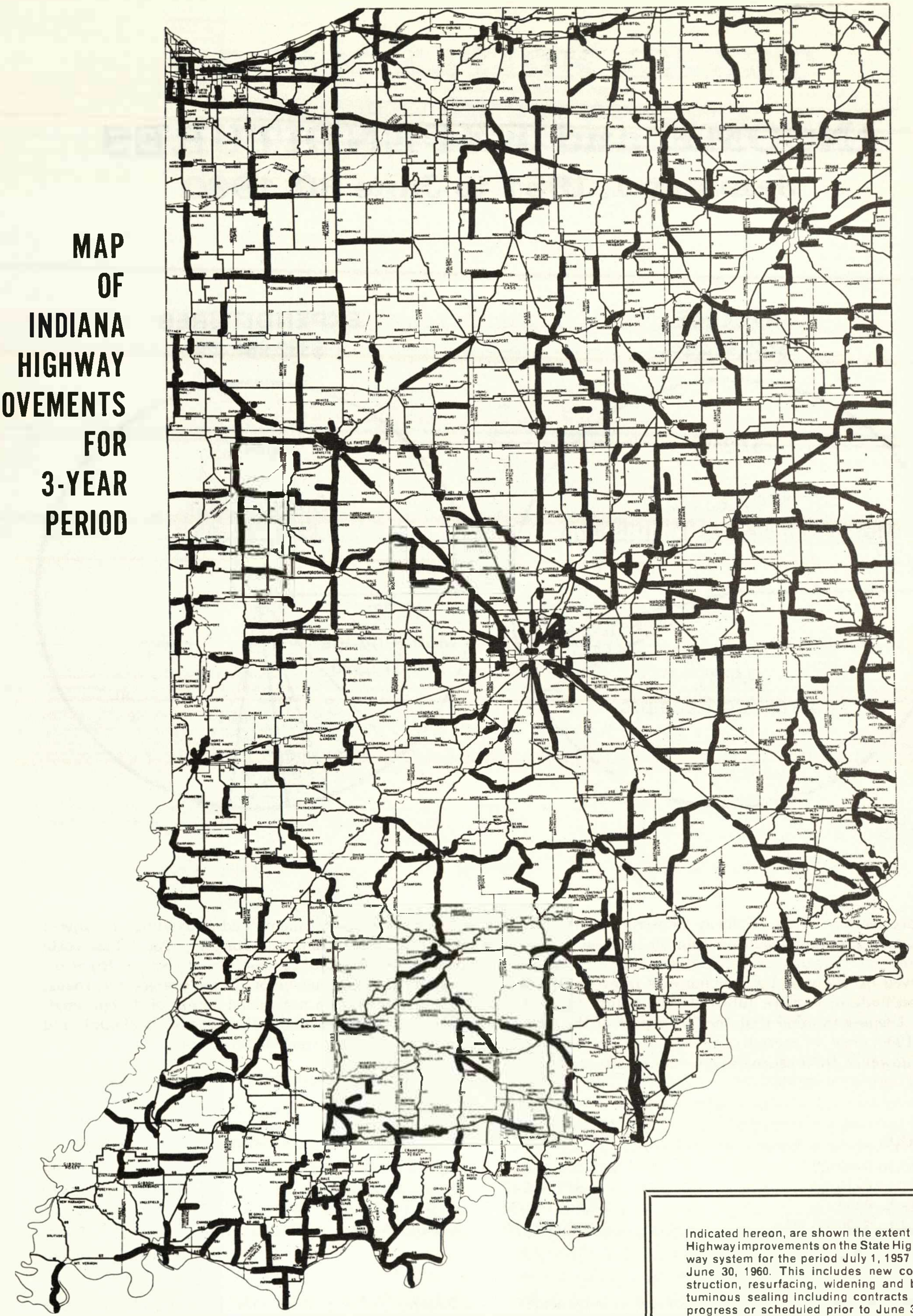
EXPENDITURES
$332,964,429

The acceleration of the Highway Construction and Improvement Program, resulting from the increase in both Federal and State finances for Highway purposes, is best observed by the year by year increase in expenditures and encumbrances since July 1, 1956 through June 30, 1960, keeping in mind that the latter part of the fiscal year 1960, must, of necessity, be estimated. In the latter case, however, these estimates are quite accurate and are based on firm commitments and scheduling of projects between March 1, 1960 and June 30, 1960. These costs reflect only the actual and estimated costs of Right-of-Way and the contract amounts for bridges and roads, respectively, and do not include costs of design, engineering supervision and other items incidental and chargeable to total construction costs.

YEAR	RIGHT-OF-WAY COSTS	BRIDGE CONTRACT AMOUNT	ROAD CONTRACT AMOUNT	TOTALS
7/1/56 to 6/30/57	$ 7,104,312.13	$ 8,168,050.20	$16,251,488.50	$ 31,523,850.83
7/1/57 to 6/30/58	7,677,883.47	16,072,968.02	47,332,149.00	71,083,000.49
7/1/58 to 6/30/59	13,061,010.70	24,097,743.49	80,294,371.94	117,453,126.13
7/1/59 to 6/30/60 (Est.)	16,500,000.00	37,801,000.00	57,706,163.00	112,007,163.00
TOTAL				$332,067,140.45

The total obligations for the current fiscal year are somewhat less than that for the previous fiscal year on account of a reduction in Federal monies resulting from contract control on the part of the Federal Government instituted in October of 1959 occasioned by the depletion of Federal Highway Trust Fund as provided in the 1956 Federal Highway Act. This resulted in the State Highway Department receiving firm commitments of Federal funds in lesser amounts than were anticipated at the time of preparing the 1959 Construction Program.

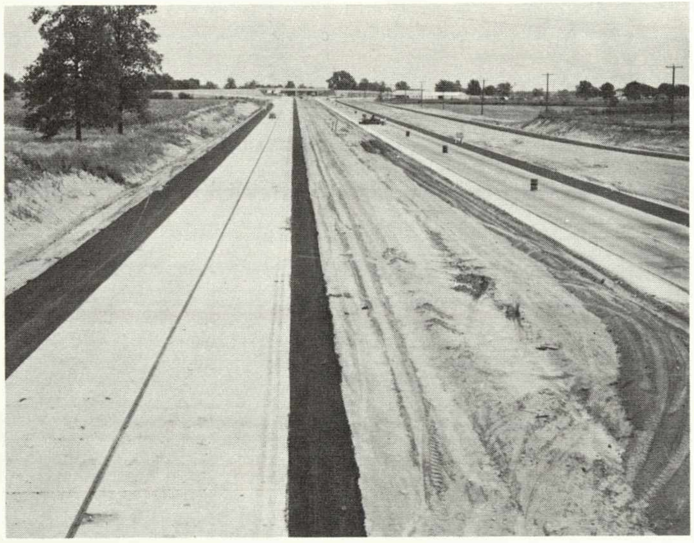
MAP OF INDIANA HIGHWAY IMPROVEMENTS FOR 3-YEAR PERIOD



Indicated hereon, are shown the extent of Highway improvements on the State Highway system for the period July 1, 1957 to June 30, 1960. This includes new construction, resurfacing, widening and bituminous sealing including contracts in progress or scheduled prior to June 30, 1960 amounting to a total of 6,500 miles of the 11,000 mile system.

INDIANA'S BIGGEST BUSINESS

11,000 Miles of State Highways



INDIANA ROAD CONSTRUCTION IN PROGRESS

The advent of the present State Highway Department administration found the finances returned to the State Highway Department increasingly deficient to meet the needs for highway improvements on the State Road system resulting from the rapidly expanding traffic volume using those highways. Highway maintenance, and new construction likewise, was suffering from a lack of adequate finances to keep pace with the expanding needs.

The 1956 Federal-aid Highway Act had been passed in the previous year allocating materially increased finances to the State to be matched by State funds. The construction of the National System of Interstate and Defense Highways had at last become a reality.

Thru a dramatic education program the General Assembly of 1957 recognized the need for additional finances to the State Highway Department and for highway purposes in general. As a result, in March 1957, the gasoline and motor fuel tax in Indiana was increased by 2¢ per gallon making the total tax on gasoline 6¢ per gallon.

The Governor recognized the immediate necessity for an expanded program of highway construction and maintenance as a result of which the State Highway Department undertook, at the Governor's direction, an immediate stepped up program of road building and maintenance. The results to date of this program are shown by the heavy black lines on the accompanying map indicating almost 50% of Indiana's highways either built, rebuilt, redesigned, surface treated or under contract for same during the period July 1, 1957 to June 30, 1960. This map indicates a total obligation for such improvements of approximately $317,000,000.00.

Broken down into categories of highway construction, bridge construction and bridge widening, and maintenance resurfacing and resealing, maps, at the back of the report in the order as herein named, show the expenditures and obligations for the 3-year period July 1, 1957 to June 30, 1960:

A. New construction contracted during the period July 1, 1957 to June 30, 1959, $148,365,415.11.

B. Bridges constructed by contract and widened by maintenance July 1, 1957 to June 30, 1959, $40,170,711.51.

C. Highway maintenance, including resurfacing and resealing roadway surfaces only, July 1, 1957 to June 30, 1959, $11,737,328.34.

D. New highway construction contracted and encumbered for the period July 1, 1959 to June 30, 1960, $74,206,163.00, exclusive of right-of-way.

E. Bridges contracted for construction or widened by maintenance, including estimated encumbrances July 1, 1959 to June 30, 1960, $37,801,000.00.

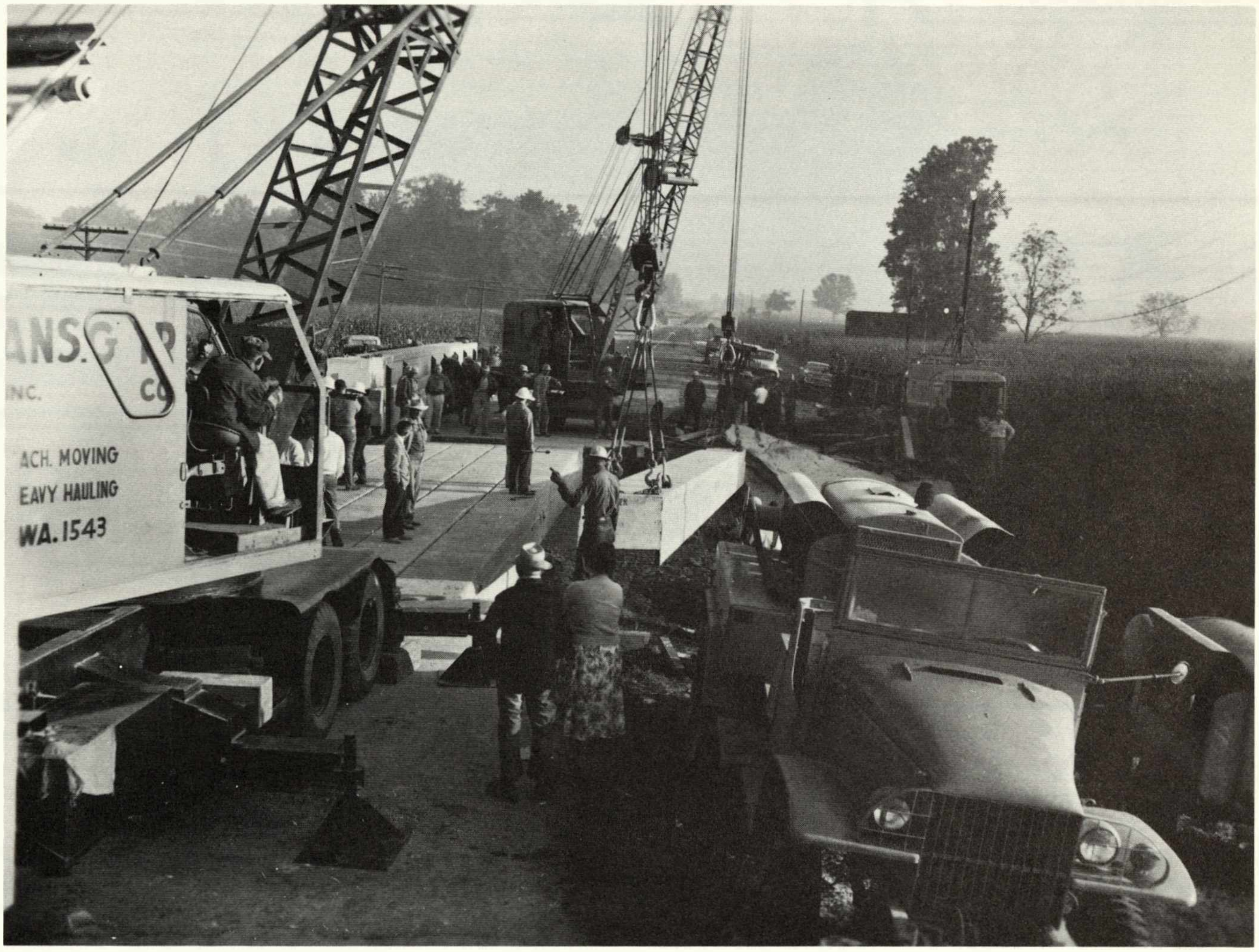
F. Resurfacing and resealing of roadway surfaces only by highway maintenance, including encumbrances anticipated July 1, 1959 to June 30, 1960, $4,500,000.00.

Total for the period July 1, 1957 to June 30, 1960 $316,780,617.96.

All contracts have been awarded on the basis of the low bids received from contractors prequalified prior to placing their bids, in accordance with Indiana statutes. Competition has been intensely competitive in the bidding for this work with an average of 4.93 bids per project. This will have produced or put under contract by June 30, 1960, 1,500 miles of new highways and more than 5,000 miles of resurfacing and surface treated highways.

INDIANA BRIDGE PROGRAM

A key part of Highway Safety



A NEW TECHNIQUE IN BRIDGE WIDENING PROCEDURES

Indiana is fortunate in having a very ample annual rain fall resulting in many streams and rivers traversing its entire area. This water supply has been favorable to agriculture and the development of diversified industry.

The rapid growth of population as the result thereof has stimulated the continuing increase in motor vehicle registrations and the miles of travel resulting therefrom. As a consequence one of the glaring deficiencies of Indiana's highway system has been the need for adequate bridges not only across the streams and rivers of this State but likewise at a great number of railroad crossings and highway intersections.

Since July 1, 1957 the State Highway Department has built new structures and widened existing bridges to the extent of expenditures in excess of $78,000,000.00. During that period there has been constructed or placed under contract, including those anticipated prior to July 1, 1960, a total of 414 structures aggregating a total cost of $75,836,443.91. Likewise during the period mentioned approximately 600 structures varying in length up to 50′ have been widened and reconditioned, involving a total expenditure of $2,770,719.38.

The bridge widening program has been carried on thru the ingenuity and resourcefulness of the engineering and maintenance divisions of the State Highway Department in recognition of the importance to the safety of the traveling public of this segment of the highway system. It has been accomplished with savings in cost and time as compared to that which would have been required for the complete redesigning and reconstruction of these smaller structures. The investment so made will well be repaid by the time it is necessary to completely reconstruct these facilities.

The accompanying photograph is an example of a bridge on U.S. 31 near Scottsburg which was widened and strengthened by the use of pre-stressed, pre-cast concrete beams with a minimum of interference to the flow of traffic of 17 hours.

See map B "Bridges Constructed and Widened July 1, 1957 to June 30, 1959."

See map E "Bridges Constructed and Widened July 1, 1959 to June 30, 1960."

INDIANA ROAD PROGRAM

The terrain and geography of the State of Indiana, together with its favorable climate and soil composition, make it not only a great agricultural state over a large part of its area, but also its location and Governmental tax structure have made it a desirable area for industry. As a result the State is blessed with over 96,000 miles of public roads and this has magnified the importance of the 1,100 mile Interstate Highway System as an outlet and collector for the vast system of feeder roads that are under the jurisdiction of the counties and cities. While the Highway System comprises over 4,000 miles of Primary System connecting the larger centers of population and traversing the routes of high volume traffic, there are nearly 6,000 miles of Feeder and Secondary roads connecting with practically every small community throughout the State.

Subsequently, World War II and until the increase in the gasoline tax, as enacted by the General Assembly in 1957, inadequate funds made impossible the improvement and maintenance of the Highway System to anywhere near keeping pace with the increasing deficiencies. In order, therefore, that Highway revenue may be efficiently expended for the greatest public benefit and with a consideration for the maximum salvage of as great a portion of existing Highways as possible, an extensive program of widening, resurfacing and alignment, both vertical and horizontal, has been in effect since January 1, 1957. This has been an important part of the Road Construction Program, not overlooking the complete new construction to 2-lane and 4-lane widths as demands of traffic have necessitated. As a result the Highway Department has constructed and placed under contract for construction:

898.980 Miles of Widening and Resurfacing

309.091 Miles of Reinforced Concrete Pavement including interstate

325.861 Miles of Bituminous Concrete including 2 course hot mix resurfacing

In the development of plans for these various constructions, the designs have been formulated after proper consideration of the materials available and the amount and type of traffic to be accommodated.

Indiana is reasonably blessed with mineral aggregates of specification quality for both Portland Cement Concrete and Bituminous Concrete construction. In the development of the economical type of construction, careful subsoil investigations are made by highly qualified engineers to determine the proper foundation treatment. Muck removal is necessary in many locations in the north part of the state, while, conversely, care must be exercised in the design of Highways through the sections of the southern part of the State so as to minimize rock excavation. Drainage problems in the flatter areas of the State also command careful consideration.

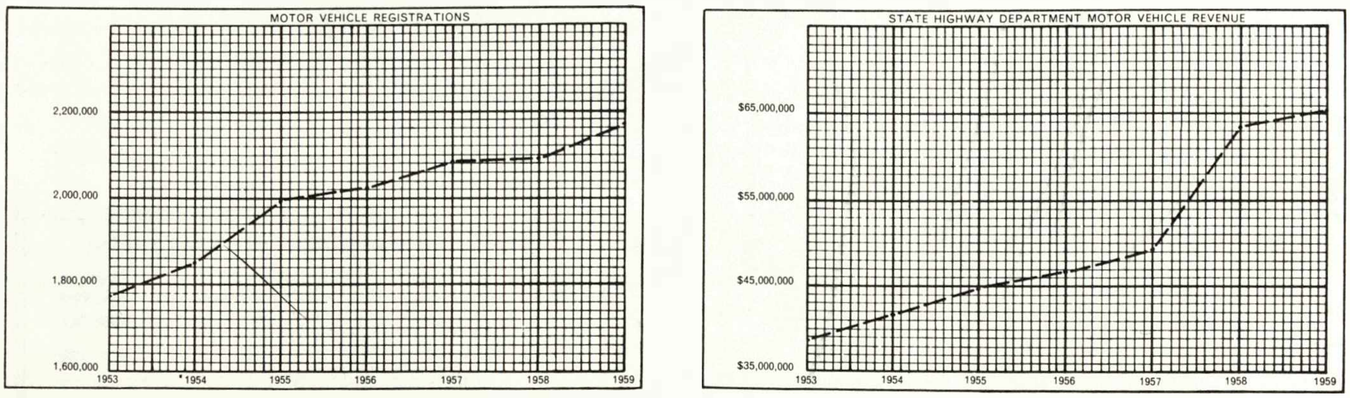
Between July 1, 1957 and January 1, 1959 the total of contracts awarded amounted to $93,742,628.47. During the calendar year of 1959 contracts were awarded for road construction amounting to $48,317,386.60. This included 70.9 miles on the Highway System, exclusive of the Interstate, 59.81 miles on the Interstate Routes, and 155.7 miles of Bituminous Resurfacing. At the close of the calendar year there was a total of 71 contracts in some phase of completion, totaling 350.7 miles, for which the total contract amount was $88,233,311.51.

Since the fall of 1957 additional modern equipment has been installed in the testing laboratory to facilitate the testing and improvement of Bituminous materials used in Bituminous Concrete construction. A separate section has been organized in the construction division for the supervision of Bituminous construction and improved results are being obtained in the quality of Bituminous Concrete Highways.

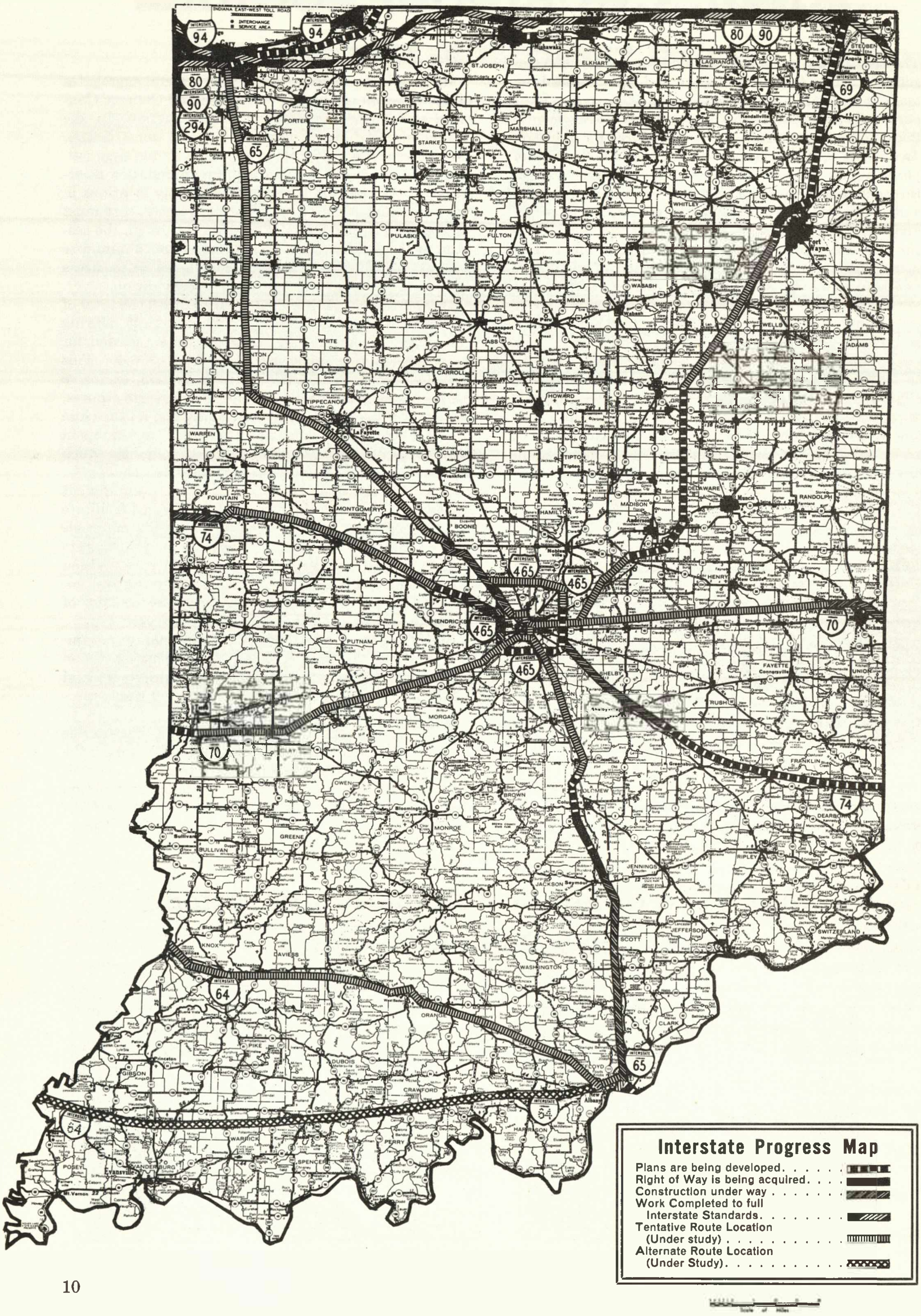
Specifications for Highway Construction are continually under study in order that advantage may be taken of improved Highway Construction equipment and methods, with emphasis being placed on end-result specifications.

Bidding competition for Highway Construction has been keen, with a result that the price index during the past 3½ years has fluctuated only a fraction of 1 percent as compared to a much greater advance in construction costs of all types of construction, as well as the National price index.

Comparison of Motor Vehicle Registrations and Motor Vehicle Revenue



Graphs show lag of revenues compared to increase in registrations prior to passage of increased gas tax in 1957.


Interstate Progress Map
Plans are being developed
Right of Way is being acquired
Construction under way
Work Completed to full Interstate Standards
Tentative Route Location (Under study)
Alternate Route Location (Under Study)
INDIANA EAST-WEST TOLL ROAD
INTERCHANGE
SERVICE AREA
INTERSTATE 94
INTERSTATE 80
INTERSTATE 90
INTERSTATE 294
INTERSTATE 65
INTERSTATE 69
INTERSTATE 74
INTERSTATE 465
INTERSTATE 70
INTERSTATE 64
Scale of Miles

INTERSTATE PROGRESS

The State of Indiana has approximately 1,100 miles of the 41,000 mile National System of Interstate and Defense Highways. This system involves routes of primary importance as to interstate travel, as well as a large segment of the vehicular travel within the state. During the past 3 years the State Highway Department has endeavored to progress the construction of the Interstate System within the state in balance with the equally important improvement to Primary, Secondary and Urban systems.

Finding itself in 46th position at the beginning of 1957 as compared to the progress made by the several states of the nation, Indiana has gradually accelerated the Interstate Program to a position consistently among the first ten states as evidenced by the progress reports by the Federal Bureau of Public Roads. Consistent with the Nationally Approved Standards agreed upon by all of the states of the nation and approved by the Department of Commerce, Bureau of Public Roads, the Interstate System is entirely limited access consisting of a minimum of 4-lane, divided highway development. Such construction wherein no right of access is permitted by adjacent properties, all crossroads are either closed or separated, all railroad crossings are separated, and points of ingress and egress are provided only by Interchanges of the most modern design, provide a maximum of safety, economical operation and minimum expenditure of time to the user.

In conformance of the above policy, it is expected that by the close of 1960 Indiana will have completed approximately 125 miles of its Interstate System. This mileage will be entirely complete to Interstate Standards in areas of greatest need as to the benefits derived by the highway user. This mileage will be approximately 20% of the total 15-Year Program of Interstate Highway Construction of Indiana.

In the execution of this program, as well as all improvements in the Highway System, justifiable pride can be taken in the fact that these improvements are debt-free. Indiana has no statutory provisions wherein the State is authorized to borrow money through the issuance of bonds or otherwise and such a policy has made the cost of our Highway work highly economical, by comparison, to the lasting credit of the State.

At the present time (Winter-Spring 1960), Indiana has put $102,410,000 into Interstate construction for a total of 138 miles, including 156 bridges. Presently completed are approximately 24 miles of road and 106 bridges: total expenditure $27,000,000.

In January 1957, the present Administration found that a realistic program for the Interstate System had to be developed, including the scheduling of surveys, plans, acquisition of Right-of-Way and bid-letting. Such programming recognized that an average of approximately 2 years was necessary from the time of such programming until actual use of the facility could be expected. A thorough review of the planning as existing at that time was done, to single out that work that could be incorporated into a realistic development of the Interstate System. The Highway Department was then directed to expeditiously develop this program, while at the same time undertake a review of the route locations for many miles of the system in an effort to create the greatest benefit to State economy.

The accompanying map shows the results of these studies in that certain locations remain tentative pending final approval prior to initiating the development of construction plans and the acquisition of Right-of-Way. In the meantime, Interstate Route 74 between Indianapolis and Shelbyville, and Interstate 65 between Jeffersonville and Seymour, expect to be in full use within a matter of a few months. Interstate 65 between Indianapolis and Lebanon is already in use and will be extended during 1960 as a part of Interstate 465 around west Indianapolis.

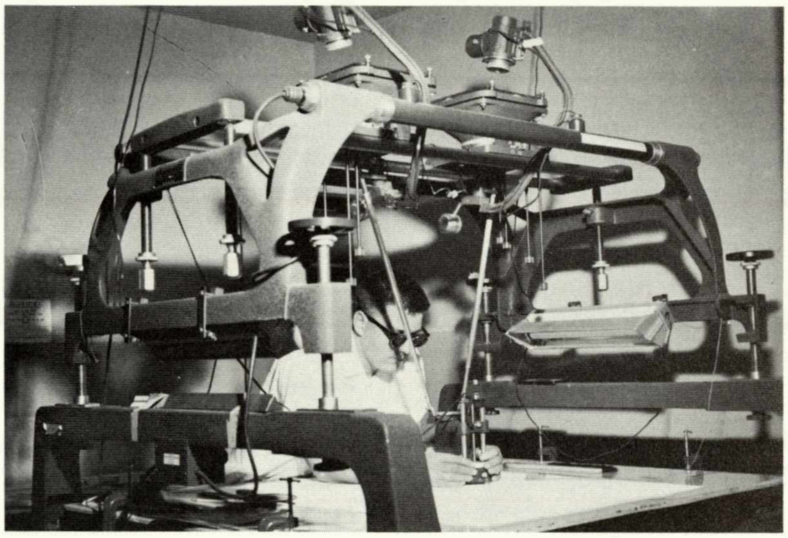
It is expected that by the end of the year Interstate Route 80 will be completed and open to traffic from the Illinois State Line to beyond State Road 53, south of Gary. Further contracts are to be let during the current year, extending this route easterly as rapidly as possible to the intersection of the Indiana Toll Road at the Lake-Porter County Line. Rapidly nearing completion is that segment of Interstate Route 70 from the Ohio Line westerly around the north side of Richmond and to a temporary connection with U.S. 40 near Centerville. This route is scheduled to be continued within the next two year program to a connection with State Road 1.

As a part of the continuing Interstate Program, contracts are being let for the by-pass around Fort Wayne on Interstate 69 from U.S. 24 to U.S. 27. The current year will likewise see the beginning of construction of Interstate Route 70 by-passing Terre Haute on the south. Construction of an Interstate bridge on Interstate Route 64, across the Ohio River, approximating the total cost of $9,500,000.00, has been under construction since July 1959 and completion is anticipated by mid-1961. Construction of the Indiana approach proceeds this year.

Concurrent with these construction operations, the continuous development of plans, acquisition of Right-of-Way, etc., will continue in anticipation of maintaining a uniform level of progress consistent with Federal finances as rapidly as they are provided and conforming with the continuity of improvement that will create the greatest benefits to the greatest number of people at the earliest date.

How We Build Roads and Bridges

Photogrammetry



In the course of preparing final construction plans, it is necessary to obtain ground elevations and plot contours on the aerial photographs in order that quantities of excavation and other construction items can be obtained. The operation of obtaining this information is done through the use of Kelsh plotters, an example of which is shown hereon.

The increased tempo of highway development in Indiana since 1957, has provided problems in mathematics, physics, and design, the magnitude of which Indiana has never faced before. Modern highway development is an extremely complex job. This is not anything which Indiana alone must face, but rather every Highway Department in the country. Old methods, old attitudes, and archaic systems must go. Those ideas are costly to the taxpayer. Modern development is the byword of the new Indiana Highway Department.

What do we mean by that? Well let's take an example. Let's consider a bridge, a typical bridge. There are numerous problems of topographical calculations, geographical design and other essentials which have to be considered before this bridge will take its final image. In the past, the first job was to send a five man surveying crew out to the site for which this bridge was to be considered. The time required for this surveying crew to do the job was approximately one week in the field. In addition to that time, the notes prepared by the surveying crew had to come back to the design office for plotting which would likely require another three weeks in plotting their findings and notes. Today through modern methods, this same job is done by an eight man crew working in a central office in approximately three days, using aerial photographs previously made. The savings in both manhours and money are readily seen.

This new development that we are talking about, covers the broad heading of Photogrammetry and Electronic Data Processing. This Division is one of the most modern of the Indiana Highway Department, and has resulted in the savings of thousands of dollars, and thousands of manhours. Previously we discussed the geographical plotting of a bridge site. Today, that bridge site is plotted through the use of aerophotography. Since November of 1958, the Indiana Highway Department has been plotting bridge sites and new road bed locations through the use of its own aircraft, a Piper Apache PA 23, modified to accommodate modern aerocamera equipment. Today when a stretch of land must be plotted, the pilot and the aerophotographer, will go out and photograph the necessary piece of ground. Afterwards, the films are developed and printed through modern high speed methods. They then are examined and interpreted by trained experts who plot the contour of the land, the geographical dimensions, the natural hazards, and all the necessary points which the construction crew must know before the crew can attempt to build the highway or the bridge that is contemplated for that section.

From the aerophotographs, the Stereo Plotting Section will produce maps with all of the necessary data written on them. A crew of sixteen in this section uses two Kelsh Plotters in furnishing design units with cross sectional information and earth work quantities for design by photogrammetry process.

Naturally in this process, mathematics plays a major part. For one man to sit down and figure out the numerous mathematical problems involved in bridge and highway design requires too much time. Our job is too large for that method. So working hand in hand with the Photogrammetry Division is the Electronic Data Processing Section. This too has been in operation for approximately two years. This section carries a crew of seven which through the use of modern IBM machine methods will now do the job in four minutes, compared to the old method where one man did the job in seventy-two hours. The computing programs cover surveying, design, construction, right-of-way and traffic analysis problems, all requiring mathematic computations; answers to which do not come quickly under the old method of computations.

Summing up this Division of Photogrammetry and Electronic Data Processing, the activities of the personnel have resulted in tremendous savings for taxpayers in Indiana. Our personnel are trained by the Indiana Highway Department, and in skill, resourcefulness, and imagination, have developed excellent ability.

The total personnel of this entire section amounts to twenty eight people who operate in floor space amounting to 4300 square feet. This space is now too small for our necessary operations. When our new office building is completed, this crew will operate in 12,250 square feet and will become involved in a considerably expanded operation.

How We Build Roads and Bridges

Planning Division Accomplishments

For the period January 1, 1957 to June 30, 1960

The Planning Division as such, did not exist on January 1, 1957. The Division was established by Commission action as of June 1, 1958. It incorporated the work which had formerly been performed by the Highway Planning Survey, the Metropolitan Surveys and Studies group, and certain functions of Route location which were being done by the Road Location Survey forces.

The Planning Division was established in order that duplication of work being done by various departments could be avoided, all work of like nature could be coordinated and the Division could be expanded to adequately handle an expanded Planning program. The Bureau of Public Roads thoroughly approved the establishment of the Planning Division and as of January 1, 1959, the entire Division was made eligible for operating cost reimbursement from the 1½% H.P.S. funds. This amounts to an annual reduction of State funds needed to operate the Division by approximately 400,000 dollars.

This report covers the activities of the groups above mentioned for the entire period even though the Division was not activated until June 1, 1958.

Listed below are the accomplishments of the Planning Division which include routine work, special assignments and new work in process, chiefly grouped under the following classifications:

METROPOLITAN SURVEYS AND STUDIES

A. *Metropolitan Origin—Destination Traffic Surveys*
   1. Origin-Destination Traffic Survey Made in Connersville Area.
   2. Origin—Destination Traffic Survey Made in Muncie Area.
   3. Origin—Destination Traffic Survey Made In South Bend-Mishawaka Area.
   4. Vincennes Area Origin—Destination Traffic Survey Report Reviewed and Published.

B. *Cost Estimate of Interstate System*
   1. Location Study and Detailed Cost Estimate of the Interstate System of 1100 Mi. made in accordance with Section 108 (d) of the Federal-aid Highway Act.
   2. A Revised Estimate of cost of completing the Interstate System of approx. 825 mi. in accordance with Section 104 (b) 5 Title 23, U.S. Code, Highways.

C. *Route Locations*
   1. Route Location and Cost Benefit studies made on much of the Interstate System including: I.R. 64 from Ind.-Ill. State Line to New Albany; I.R. 65 from U.S. 50 to Indianapolis and from Lebanon to I.R. 80; I.R. 69 from Indianapolis to U.S. 30 and from Auburn to Ind.-Mich. State Line; I.R. 70 from U.S. 41 south of Terre Haute to Indianapolis and from Indianapolis to Centerville Road; I.R. 465 North and East Legs around Indianapolis.
   2. Numerous studies made on Primary and Secondary Highway System as directed including U.S. 41 By-Pass at Evansville, U.S. 41 through Hammond; S.R. 23 in South Bend and roads in Porter County involving proposed port facilities.

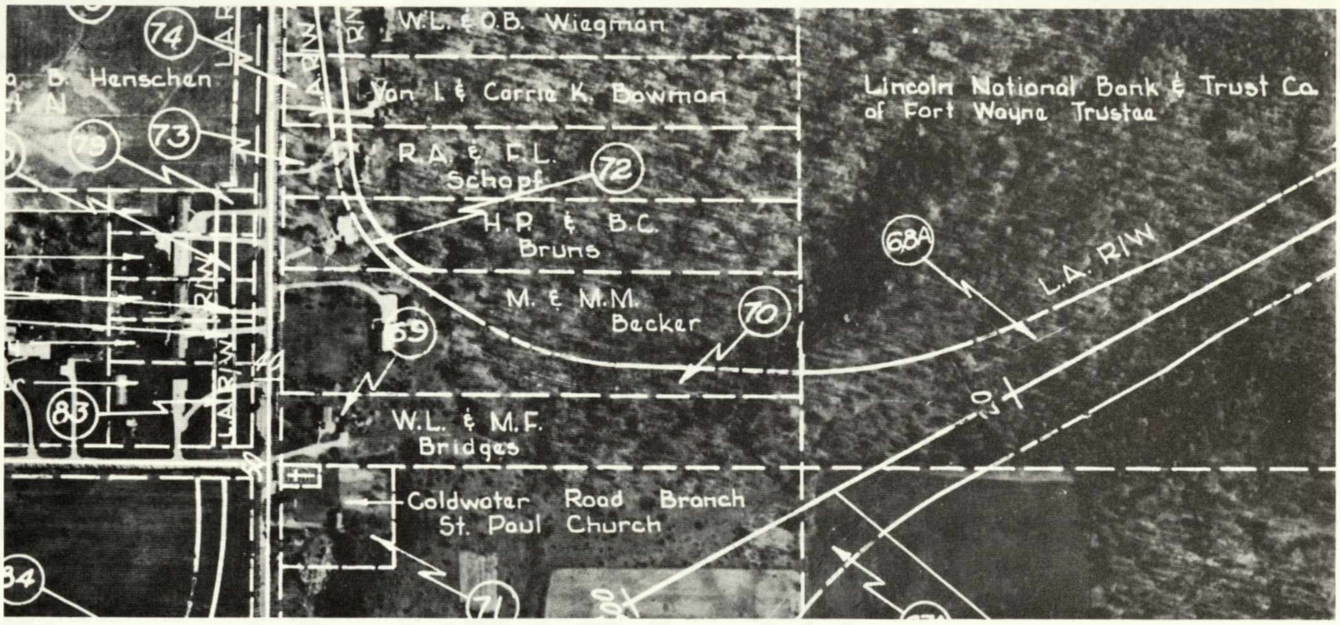
D. *Special Studies*
   1. Traffic estimates and turning movements provided on all Interstate, Primary, Secondary Routes, and By-Pass Locations including: Interchanges, Highway Separations and Frontage Roads for design criteria.
   2. Cost Benefit and Justification studies made on all Interchanges and Highway separations on Interstate System.

E. *Highway Access Permits*
   All requests for Private and Commercial drives for access to limited Access Highways are investigated, checked and reviewed after which recommendations are made to Engineer of Roads for Commission Action.

F. *Road Life Study*
   1. Cost data on 650 road contracts (construction, reconstruction, resurfacing and maintenance) and 500 bridge contracts have been and will continue to be analyzed, recorded and reported on an annual basis.
   2. Maintenance costs have been and will continue to be recorded by road and section.
   3. All the above data has been platted on log sheets which provide an up to date record of costs, retirements and existing road structure.
   4. Road life curves have been developed from the above information.
   5. As a special assignment, an Inventory log of the entire Federal Aid System was prepared.

G. *Traffic Information*
   1. Twenty-three permanent Automatic Traffic Counters are operated and maintained by the Division. Data from these recorders is issued in monthly and annual reports. This data has many uses, such as the basis for the State wide flow maps, estimating traffic on roads to be constructed in the future, analyzing special traffic conditions, etc.
   2. Some 75 portable counters are kept in constant use collecting traffic count data for the preparation and revision of county traffic maps, special studies as requested by the State Highway Department, Bureau of Public Roads, and studies made in cooperation with various cities and counties.
   3. An annual Loadometer survey is made at 20 locations using both permanent and portable scales. From these surveys, reports are developed showing commercial vehicle distribution, frequency of overloads, average axle loads and other related information.
   4. Manual counts have been, and are being made at regular intervals on Test Road sections and at such other locations as needed for various special studies.
   5. A state-wide traffic flow map was made early in 1959 showing average annual daily traffic on the State Highway System.

H. *Inventory*
   1. Checked maps of all incorporated towns in the state (approximately 540). This involved revisions of approximately 45%. Revisions varied from minor corporation limit changes to completely new drawings. 20 maps of cities over 5,000 population have either been redrawn or reproduced photographically, with reduction or enlargement to convert them to standard engineering scale. 30 smaller towns have been remapped from new field data checked by aerial photos.
   2. Established new key map and a coordinated card file



As a part of the operations of Photogrammetry the first and most important undertaking is that of securing aerial photographs. These are obtained by flying at a definite elevation over the route to be surveyed with a camera mounted in the plane that will produce negatives from which photographs to a definite scale are obtained. These photographs permit the designer to lay out with drafting equipment the alignment that is finally determined from careful study of these pictures. Such an example is shown in the above photograph.

system for a simplified and more accurate tabulation of state and county road inventory data. 30 counties have key maps completed, approximately 25,000 cards printed for condensation of survey data.

3. Since April, 1959, supplying information to and checking the work of engineering personnel engaged in making a comprehensive survey of all state and county roads. Approximately 250 drawings of unincorporated areas made as a part of this work.
4. Revised Urban Area Boundaries on 25 cities.
5. Established card file system to insure current revision of all county, city and town maps as limits of urban area change, and new road construction is completed.
6. Mileage tables indicating road surface type, roadway width, widths of right-of-way, and other pertinent data are prepared annually from the information listed above.

I. *Highway Needs Study*

1. As directed by the Indiana State Legislature, a Highway Needs Study based on a sufficiency rating has been made and a two year proposed construction program based largely on information contained in the above study is being prepared for submission. It is the intent of the Division to make this a continuing study.

J. *Urban Plan Co-Ordination*

1. A program of co-ordination with public planning groups was started in 1958. This program has been needed for sometime. In February, 1960, an Urban Plan Co-ordination section was set up within the Division. Much headway has been, and is being made in cooperation with both city and county planning agencies in regard to thoroughfare planning co-ordination, land use programs and zoning permits.

K. *Financial*

1. The Financial Section of Planning Division compiles and summarizes the receipts and disbursements of Street Funds, Parking Meters and Allied Funds of all incorporated cities and towns. This is also done for the Gravel Road, Cumulative Bridge and Allied Funds of all 92 counties. Outstanding indebtedness is compiled and reported insofar as county roads, bridges, streets and allied expenditures are concerned.
2. Records are compiled throughout the year from various periodic reports submitted to this office by State Agencies, which enables us to furnish data in report form to the Bureau of Public Roads.
3. The summary of quarterly distribution made to the several political subdivisions from the Motor Vehicle Highway Account during each calendar year is compiled and distributed to public agencies, semi-public agencies as well as certain interested individuals.
4. Special reports that have been made since 1957 include study of motor bus operation, research data on transfers from the State Highway Commission to the General Fund in previous year for the State Legislature. Data concerning State Road users taxes and property taxes in a selected group of Motor Vehicles was prepared.

L. *Special Work*

Many special studies, too numerous to mention, are performed under supervision of the Planning Division. These are in cooperation with various Federal or State Agencies and State Universities. These studies are of engineering, economic or factual nature.

M. *Administrative Work and Reports*

The following work and Reports are done entirely by administrative personnel:

1. Revision reports of the Federal-aid Secondary Routes.
2. Revision reports of urban limits.
3. Certify county road mileage as received from the County Auditors to the State Auditor for gasoline tax distribution.
4. Compile a report of county road mileage by surface types as submitted by the County Road Supervisors. These reports are available to interested agencies.
5. Compile a report of city street mileage by types as submitted by officials from all incorporated towns and cities. These reports are also available to interested agencies.
6. The Planning Division prepares and submits to the Bureau of Public Roads 50 different form reports annually.

N. The Planning Division maintains and operates a Tabulating Department which handles much of the tabulating work of the Division. This department is to be expanded as soon as adequate space is available.

How We Build Roads and Bridges

RIGHT OF WAY DIVISION

The Right of Way Division of the State Highway Department has the responsibility of acquiring the necessary rights-of-way for highway improvements and related needs.

In 1957 this Division was completely reorganized, which reorganization met with the approval of the Federal Bureau of Public Roads.

Recognizing the importance to property owners of right-of-way takings for highway improvements care is exercised in the planning of such highways to require the acquisition of a minimum of right-of-way consistent with proper design to meet modern highway standards.

At the beginning of 1957 the State Highway Department found itself with a depleted right-of-way budget and with claims against this Division of approximately $1,250,000.00. In addition the Federal Bureau of Public Roads had advanced Federal moneys in previous years in an approximate amount of $3,500,000.00 that had been charged against and withheld from Federal reimbursements otherwise due the State of Indiana. As a first order of business it was therefore necessary to reallocate moneys from State Highway Department revenues to satisfy the claims against the Right of Way Division after proper review and documentation of those claims. It was further contingent upon the Highway Department to reappraise and document, insofar as possible, those right-of-way acquisitions that had been made on the basis of the advancement of Federal funds in order to release to the State to the fullest possible extent those moneys for further use. This work has all been accomplished to the fullest possible extent and placed in the hands of the Federal Bureau of Public Roads for concurrence.

As a result it is anticipated that within the current year all withholdings against the State Highway Department will have been released.

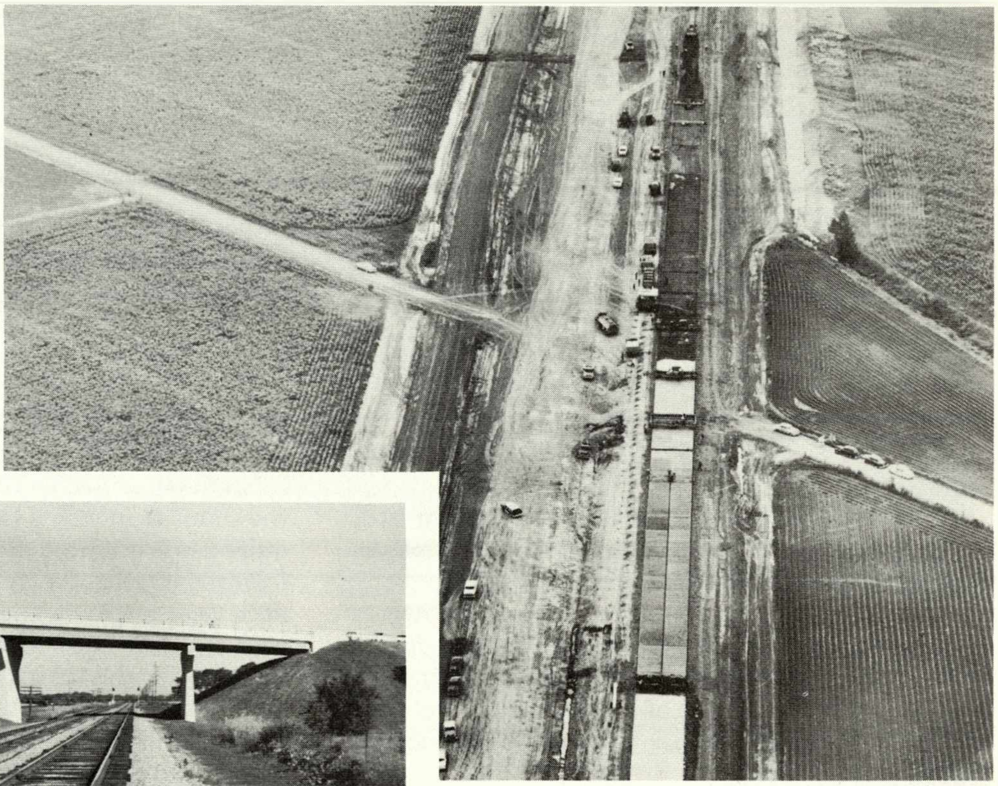
These responsibilities were in addition to that of rapidly expanding the operations of the Right of Way Division to keep pace with the expanded highway construction program. The extent to which this has been successful is evidenced by the fact that over $15,000,000.00 was expended during calendar year 1959, for right-of-way needs.

The reorganization of the Right of Way Division has included the employing of independent abstracting firms in each of Indiana's 92 counties as well as retaining qualified independent land appraisers from the counties in which the respective right-of-way requirements occurred. This latter procedure has been followed so that the appraised values could best reflect local prices to the individual property owners with greatest assurance of a fair return to each individual for the taking of property needed for highway purposes. At the same time the regulations of the Federal Bureau of Public Roads as affecting their participation in right-of-way costs is carefully observed and every attempt is made, within the limits of these regulations and the statutes of the State of Indiana, to provide equal and fair treatment to all property owners from whom rights-of-way are needed. Increasing confidence in the Right of Way Division of the State Highway Department is evidenced by the decreased number of condemnation proceedings that have to be undertaken under the right of eminent domain of the State. Such proceedings have been reduced to approximately 16% of our total takings which now compare favorably with such proceedings in the other States of the Union.

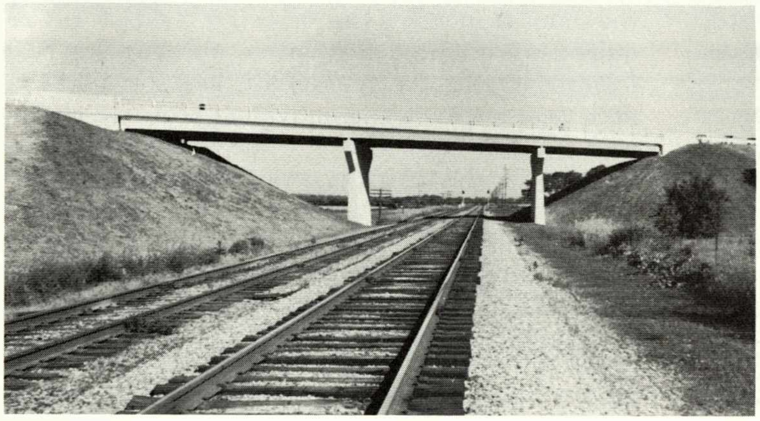
With the highway improvement program progressing on an accelerated basis to modern standards of design dictated by the rapidly increasing traffic volume, the individual property owner may anticipate to a considerable extent those improvements which may affect his property.

Under those circumstances, a representative of the Right of Way Division might come knocking on your door some day soon. If he does just remember that the State of Indiana wants you to have the advantage of every right and prerogative that is yours as an owner of land needed for such highway and consistent with the rights and privileges of the citizens of the State as a whole. Remember too that this Right of Way man represents the nearly 5,000,000 citizens of the State, including yourself, who have a big stake in the benefits to be derived from the highways of tomorrow. Highway improvements are designed not only for today's needs but for those several years in the future.

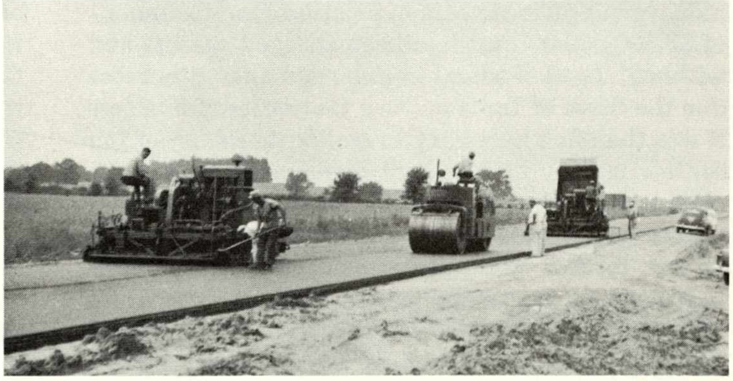
How We Build Roads and Bridges



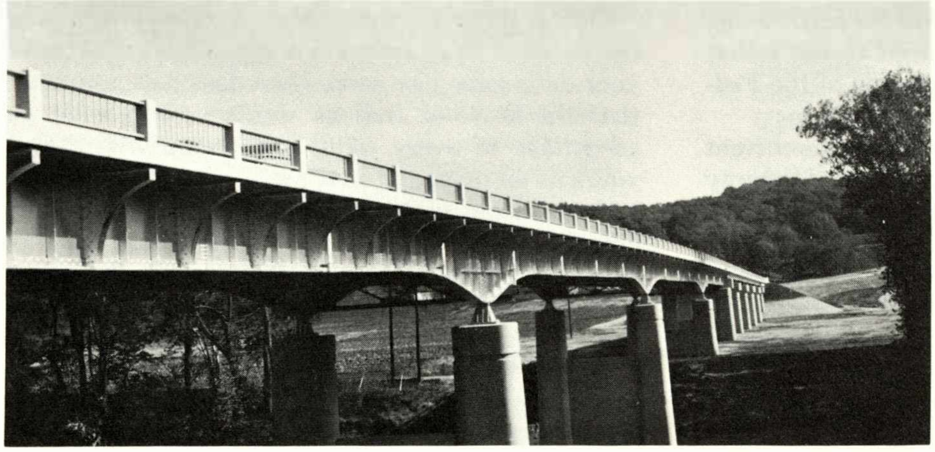
Dual Lane Interstate
Under Construction—Portland
Cement Concrete Pavement.



Typical Primary Route
Railroad Grade Separation



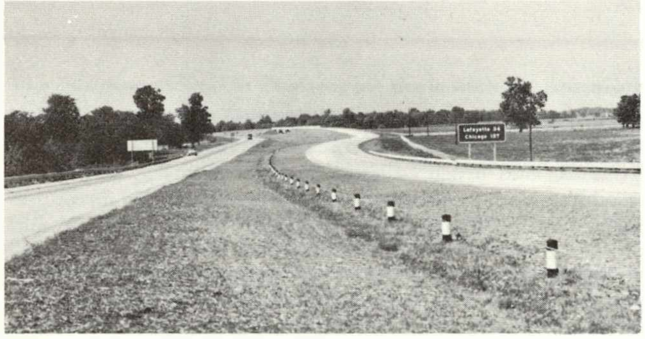
Typical Bituminous
Concrete Construction



Modern Bridge Construction
Structure over White River
at Spencer, Indiana—
State Road 46.

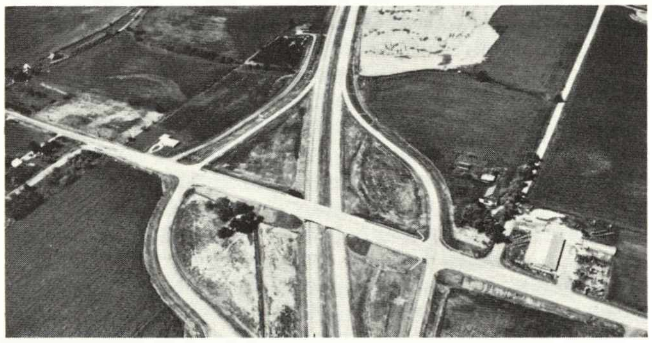
How We Build Roads and Bridges

SYSTEMS OF HOOSIER HIGHWAYS


TYPICAL PRIMARY HIGHWAY CONSTRUCTION

TYPICAL SECONDARY HIGHWAY CONSTRUCTION

TYPICAL URBAN HIGHWAY CONSTRUCTION


TYPICAL INTERSTATE HIGHWAY CONSTRUCTION

The State Highway System of Indiana, like all other States, is divided into four different systems for the purpose of allocating Federal aid.

The earliest of these systems was that referred to as the Primary System which was developed as a part of the Federal-aid Highway Act of 1916 wherein 1/7 of the total rural mileage of each State was eligible for designation as a part of the State Highway System. A system of approximately 4,000 miles was originally designated for this system under the jurisdiction of the State Highway Department. This system has been expanded thru the years to a total of approximately 4,891 miles.

Later a second system was developed known as the Secondary Federal-aid System, and whereas the Primary System consists of those heavy traffic routes between the larger urban centers, the Secondary System is more of a farm-to-market system connecting with the smaller communities throughout the State. This system currently comprises approximately 5,836 miles of the total State Highway System.

Still later, about 1942, a Federal system was designated to be known as the Urban System, namely those routes inside incorporated areas which connected the Primary and Secondary routes entering and leaving those communities.

The fourth system was created in 1944 by the Federal-aid Highway Act of that date and known as the National System of Interstate and Defense Highways. Its construction was not initiated, however, until the Federal-aid Highway Act of 1956.

Other than these four systems there is a limited mileage of State Roads that are not under any of these four system designations.

The Interstate System is often referred to as the trunk or backbone of the entire highway system. Its location can and does include certain segments of the Primary System but its purpose is to carry peace-time as well as defense highway traffic between distant centers of large population as well as to collect traffic from the feeder systems otherwise known as the ABC System and consisting of the three systems heretofore mentioned.

Thus the total system of all categories of highways under the jurisdiction of the State Highway Department today amounts to approximately 11,000 miles.

How We Build Roads and Bridges

State Highway Department of Indiana

Division of Maintenance

Maintenance operations of Indiana's 11,000 miles of State Highways are handled under the supervision of the Indianapolis Central Office through the six (6) Districts and the thirty-six (36) Sub-District Headquarters.

The Division supervises the maintenance and repair of the main roadbed and surfaces, guard rail and posts, road shoulders, informational and safety signs; cleaning, painting, replacement and repairing of bridges and culverts; the removal and treatment of snow and ice; and the cleaning of city streets maintained as State Highways. Also included is the mowing, patrolling and cleaning of all highway rights of way; and the maintenance and placement of signage and lights, for the protection of the traveling public, in reference to detours, dangerous travel areas and flooding conditions.

The Division Personnel prepares specifications for the purchase of equipment, materials, supplies and stockroom parts. The Division also prepares plans and specifications for contractual bidding in regard to herbicide treatment of roadsides; bridge repairs, replacements and widening; bridge painting and bituminous surface treatment. Other duties include maintenance and repair to buildings, grounds and State Police weigh stations. The Districts also construct material and equipment storage sheds and patrol buildings. In addition, contractual building and utility repairs are handled by the Division. The Division also prepares the annual programs in regard to bridge widening; bituminous resurfaces; surface treatment and seal of State maintained roads; and also helps prepare the annual program for the reconstruction, widening and resurface of Primary and Secondary roads.

The Equipment Department operates under the Division of Maintenance through the Central Garage and thirty-six (36) Sub-District Garages; and supervises the maintenance of over 7,500 pieces of major equipment. Equipment and stockroom parts are purchased through the Central Office so that the economical advantages of large quantity purchases can be realized. Inventory Control of equipment and parts has been set up to reduce excessive inventory; and to properly distribute materials, parts, supplies and equipment among the Sub-Districts. The purchase of Government Surplus Equipment at substantial reduced costs has supplied the need for equipment which, otherwise, could not have been purchased through the normal operating budget.

The Central Garage at Indianapolis services and repairs motor vehicles in the area; operates the parts distribution center for all Sub-District Garages; overhauls motors, carburetors, generators and other accessories; and handles the repair and overhaul of heavy equipment; in addition to the emergency repairs made by Heavy Equipment Mechanics.

The Landscape Department, working in conjunction with the Maintenance and Construction Division, supervises tree trimming and brush control; roadside planting, re-seeding, resodding and erosion control; herbicide treatment of the planted areas outside the main surface of the highway; and the maintenance and development of Roadside Parks and Tables. A total of ninety-five (95) Roadside Parks are maintained on State Highways, in addition to approximately six hundred (600) Roadside Tables, for the public.

Widening narrow, high accident bridges with pre-cast or pre-stressed slabs, has received special attention. Shoulder stabilization with experimental projects is being completed as money permits. This includes road surface widening by Force Account in preparation for future surface treatment. Special bituminous mixes, using different Aggregate sizes and Asphalts, are being tried in cooperation with Purdue University, to develop new methods and materials. A number of bituminous road surfaces have received heater-planer treatment. This method restores original surface contour and in addition tends to reduce the skidding factor.

Experimental de-slicking mixes have been laid on several sections of highway, to test wearing and anti-skid features.

In the Central Office, the Office Engineer of Maintenance and Permits checks contracts, estimates and contract payments; prepares summary reports, collects highway data and prepares an annual report. In addition to the detour bulletin, he collects and furnishes information on road conditions to the Press, Radio, Television and the Public. A major duty is the issuance of permits to contractors, haulers, movers, and builders, commercial and private entrance applicants, private utilities officials, all in connection with the use of State Highways and Rights of Way. The calculation and collection of fees for such permits is included in his duties. The preparation, correction and publication of Official Highway Maps are under the jurisdiction of the Office Engineer.

Three of the Districts will operate and maintain substantial mileage of Interstate Highways prior to the fall of 1960. Plans for buildings, equipment and personnel are being formulated by the Districts for submission to the Commission.

The main responsibility of the Maintenance Division is to provide the traveling public, commuters and wage-earners with safe, year around, maintained highways. There is always the problem of maintaining and servicing the highways in a manner which will satisfy public demands, within our budgetary limits. The overall vehicular traffic increase of approximately 4% per year, plus the completion of many miles of multi-lane Interstate and Primary Highways, are presenting additional budgetary problems.

SUMMARY OF DISBURSEMENTS

July 1, 1956 to June 30, 1957 (Disbursements)	$14,881,343.21
July 1, 1957 to June 30, 1958 (Disbursements)	16,128,277.69
July 1, 1958 to June 30, 1959 (Disbursements)	19,353,010.06*
July 1, 1959 to June 30, 1960 (Approved Budget)	20,078,000.00
	$70,440,630.96

*Increase in Fiscal Year 7/1/58 to 6/30/59 was caused by increase in Maintenance salaries, wages and a stepped up program of bridge widening, emergency flood damages, severe winter surface damages and increased bituminous resurface program.

How We Build Roads and Bridges

State Highway Department of Indiana

Accomplishments of the Traffic Division

The Division of Traffic Engineering deals with the operation of traffic on streets and highways as their use is related to the safe, convenient and economic transportation of persons and goods. The safety and welfare of the traveling public is the prime objective.

Early in 1957, the Division started to expand to include more responsibilities. A separate drafting section was established to provide a more efficient means of producing necessary drawings and plans. Another section was set up to handle all traffic matters pertaining to the Interstate Highway System including processing of contracts and preparation of plans and specifications for signing and lighting the Interstate System to American Association of State Highway Officials and Bureau of Public Roads standards. A special section was also created to draw up plans and prepare contracts for construction of channelization, passing blisters, and re-design of intersections to make better use of existing facilities.

Another very important section was established to prepare the State Accident Spot Map, to gather and prepare information concerning accidents, to make intersectional and strip collision diagrams and studies and to see that this information was sent to the six Districts for their use in making improvements to reduce accidents.

The revised "Indiana Manual on Uniform Traffic Control Devices" was completed and distributed to all public officials in the State who are responsible for traffic engineering duties. This had not been done since 1939, and was an outstanding achievement of the Division. The purpose of the manual is to provide the information and knowledge for all responsible authorities in order to achieve uniformity in signs and traffic control devices on *all* streets and highways in the State.

A Traffic Survey Section was established to make special surveys and assist cities throughout the State in solving their traffic problems. This Section cooperated with and was a member of the Governor's Traffic Survey Team, which made many studies in cities that requested help.

On July 1, 1959, the Division was placed on a separate Budget in order to facilitate the accomplishment of the many and expanded functions which have been added to the Division. An amount of $3,200,000.00 per year was set aside for this Budget. This included funds to operate working organizations in each of the six Districts. This included thirty-three employees in each District and fifty-one in the Central Office or a total of two hundred forty-nine employees in the Division. The field work had previously been done by Maintenance forces, but this change in organization combined the activities of the Division into one group which could operate much more efficiently and to better advantage for the people of Indiana.

A long range plan was started to re-sign all State Routes to bring them up to national standards. Some new signs were designed such as the green and white distance and destination signs using lower case letters. A list of the highest accident locations was prepared and as soon as improvements were made, new locations added and more changes made. Some drastic reductions in accidents were achieved. The design section started reviewing all road plans and making recommendations for changes to improve the operation and safety of newly constructed roads. A long range plan to improve traffic signals was started. Many volume density fully actuated signals were installed to replace old style fixed time controls in order to eliminate delays and provide more efficient movement of traffic. Center and lane line paint striping equipment was increased to provide two units in each District. The painting program was expanded to include more roads and edge line painting was started with edge lines being painted on curves, approaches to narrow bridges and other hazardous locations on all primary roads. This program will be expanded to other locations as rapidly as materials, equipment and manpower is available.

Specifications were reviewed, revised and new ones added for all materials used by the Division. The operations of the Central Warehouse were expanded to include traffic signs and sign hardware, a more complete stock of traffic signal supplies, a complete repair shop for traffic signals, and a greatly improved stock control system. The traffic signal maintenance program was set up to provide more maintenance to be done by the Division and less by private contractors, thus reducing the costs involved. A complete inventory of traffic signals and flashing beacons on State Highways was completed.

In order to better show the activities of each section of the Division, a tabulation of the work done has been listed below:

TRAFFIC SIGNALS

Traffic Signals installed—260. Flashing Beacons installed—16. The installation of traffic signals and flashing beacons is made only after a thorough study of need has been made to ascertain that the intersection characteristics and traffic pattern exceeds minimum criteria uniformly adopted as necessary to establish electronic traffic control.

A similar program has been established for modernization of traffic signals at high accident rate locations. The annual expenditure for materials needed in this vital work is approximately $650,000.00.

TRAFFIC SIGNS

133,850 new signs, fabricated to most recently adopted national standards, have been placed throughout the State Highway System; while priority has been given to complete new signing of 2,000 miles of primary through routes. Indiana is one of the foremost States of the nation in the adoption of "Interstate Highway" reflectorized green background Destination and Distance type signs for use on our Federal and State primary routes. It is the policy of the Indiana State Highway Department to erect all new, modern signs on new highways. Indiana has completed the sign installations on 18.24 miles of National Interstate Highways, and will have completed or have under contract by June 30, 1960, 85.24 miles of sign erection work on the Indiana portion of the National Interstate Highway System. Also, our program includes new signs with a large number of overhead and over-the-roadway mountings for all State routes within the City of Indianapolis, as well as other needed locations, with emphasis on congested urban areas and multiple lane routes. The cost for materials has been approximately $1,200,000.00 per year and will require two and one-half years to complete.

ROADWAY MARKING

This work has been expanded by resurveying the limited sight distance locations on all State highways, resulting in safer "NO PASSING" zone practices.

Our first pavement edge painting was done in 1958. The public has been very favorably impressed by the safety feature of edge painting and this work will be extended in every way possible, commensurate with available finances for such purpose, during the year. This phase of our highway safety program involves the expenditure of approximately $475,000.00 per year for material and equipment alone. Traffic paint required for pavement marking yearly is about 100,000 gallons of white paint and 75,000 gallons of yellow. Glass beads are dropped into the fresh paint as the lines are applied on the road surface to obtain night-time headlight beam reflection of the painted markings. About 1,000,000 lbs. of glass beads are used each year for this purpose. Each of the six highway Districts in Indiana is provided with two pavement striping machines, each machine requires a crew of seven trained men. The pavement marking season starts as soon after April 1st as weather conditions permit. The schedule requires that all primary routes be completely marked by May 30th. The work then continues until all routes are marked. An effort is made to repaint the locations subject to rapid deterioration. This repainting is scheduled late in the fall season in order to provide pavement lines as far into the winter months as possible.

SPEED ZONES AND PARKING RESTRICTIONS

This work included the investigation, studies and recommendations for 845 separate locations on rural and urban routes for the need and establishment of proper restrictions within practical limits; all for the maximum protection of the public.

ACCIDENT PREVENTION STUDIES

This work involved the compilation and study of 750 accidents at road intersections, 47 accidents at bridge locations, and 81 accidents along the open highway. Accident diagrams were drawn and distributed to the respective highway District offices to be used as the basis for initiating protective measures. A minor protective measure would be the erection of new or different signs. The need for traffic signals is sometimes indicated, while a major improvement such as re-design and re-construction of the highway would be the only solution.

HIGHWAY ACCESS PERMIT SECTION

This work involved the review and processing of 1,888 applications, including the design plans for commercial developments wishing access to State highway routes.

STATE-CITY-COUNTY RELATIONSHIP

A great number of meetings were arranged with members of these groups; the objective being cooperation and coordinated planning for efficient traffic movement and controls.

PUBLIC RELATIONS

The Traffic Engineering Division is easily accessible to the public at large. This fact obligates the Department to resolve complaints, disseminate information and to carry out a continuous program of general education leading to universal knowledge of traffic control features.

TRAFFIC DESIGN SECTION

This section reviewed 444 sets of road construction plans to determine the traffic adequacy features of the design. As soon as trained personnel becomes available to the Traffic Engineering Division it will be desirable to have all construction plans approved by this Division before the proposed construction work is placed under contract.

TRAFFIC ENGINEERING DIVISION RECONSTRUCTION PROJECTS

The Division had direct control and supervision of six reconstruction projects. The projects provided for the construction of additional traffic lanes and the channelization of driveways to roadside development. Each such improvement, although limited to less than one-quarter mile in length, had become imperative due to traffic congestion, accident experience or potential traffic hazards. Sixteen additional projects in this category are on the drawing board and the improvements are programmed for the construction phase within the next eighteen months. The work completed or under contract in this endeavor requires the expenditure of approximately $176,000.00.

HIGHWAY LIGHTING

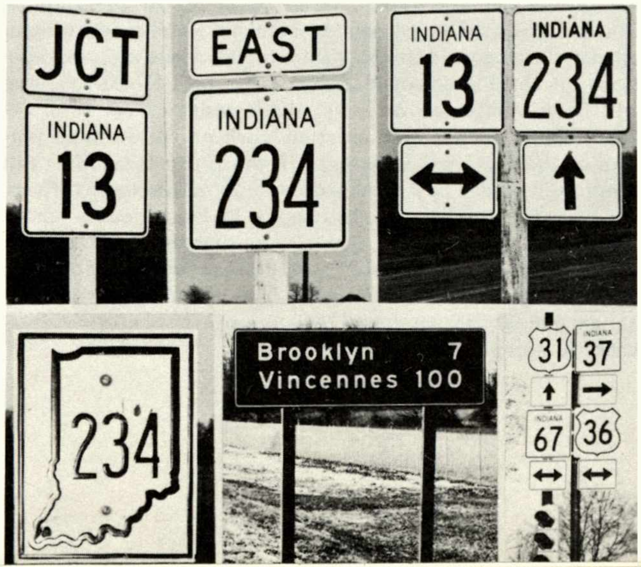
This accomplishment consists of the illumination of three major highway interchanges, two highway grade intersections, one railroad grade crossing, and at two locations where we have transitions from multiple to single lane roadway. Also, "spot hazards" have been economically reduced at three locations by the use of one light unit.

The cost to the highway user for highway illumination can be roughly estimated at $100.00 per light per year.

RAILROAD GRADE CROSSING PROTECTION

The installation of railroad traffic actuated flashing signals at 183 grade crossings has been completed. At approximately one-fourth of these grade crossings, additional protection was provided by the installation of one-half roadway width gates. The number of tracks in the crossing and speed of railroad traffic determines the need for roadway gates. It is difficult to estimate or generalize on the cost of providing modern automatic grade crossing protection. No two crossings are the same. The cost is influenced by numerous factors, such as the number of tracks, number and location of switch tracks within the operating circuits, number and type of railroad signal circuits carried through the section of track, speed of trains, and the variation in speed, such as 90 MPH for passenger trains and 10 MPH for freight trains. If 90 MPH speeds are obtained, circuit length must be approximately 3,300 feet in each direction. It is then necessary to install numerous relays to prevent undue and unnecessary operation of the signals for the slower trains. The general range of cost for flashing light signals would be from $8,000.00 to $17,000.00, and from $16,000.00 to $50,000.00 for the installation of modern automatic flashing light signals and short arm gates.

OLD TYPE SIGN (lower left) AND NEW TYPE SIGNING TO MODERN STANDARDS



SAFETY ROAD STRIPING AT EDGE OF ROADBED

How We Build Roads and Bridges

MISCELLANEOUS

Legal Department

The Attorney General's Office assigns legal personnel to the Highway Department as needed. This personnel handles all matters of court action having to do with acquisition of right-of-way as well as various claims for damage filed against the Department of a miscellaneous nature. The cost of legal personnel is financed from the Highway Department funds. Close cooperation and liaison are essential to the smooth operations of the Highway Department and the Right of Way Division.

Personnel

There is some seasonal employment in the State Highway Department, some fluctuation of the total employment, but the average is approximately 4,500 employees. The creation of the state-wide payroll for these people plus filing of all necessary pertinent data for each individual is the primary job of the Personnel Division. The problem of safety for the men who are out daily on heavily traveled, high-speed roads making necessary repairs is a responsibility of a Safety Director operating under the Personnel Director. Engineering personnel in the Highway Department total approximately 464.

Research and Testing

Progress in solving highway needs requires continuous research in new methods and materials as they become available for use. Extensive long-range research problems are carried on with Purdue University in a continuing joint highway research project in cooperation with the State Highway Department. Less extensive research is conducted in the testing laboratory adjacent to the central office in Indianapolis. The Testing Laboratory, however, has as its main function the testing of all materials that are used in highway construction and maintenance. For example, more than 72,000 separate tests of material were made in the fiscal year 1959. Of these, 7,000 tests were on cement, approximately 3,000 tests on aggregates and over 700 tests on paint. Testing materials is essential to assurance to the public, and to the responsibility vested in the State Highway Department, that all materials going into the permanent construction of highways, as well as those used in the maintenance thereof, meet the specifications under which the purchases were made or contracts executed. Independent of this current testing of materials, to do research is essential in the development of more efficient and economical use of processes and materials as well as designs and methods.

County Federal Aid

Counties of Indiana have achieved a new pace in county road progress. The organization of the State Highway Department has been expanded to create a County Federal Aid Section to which has been appointed an experienced group of engineers to assist in the handling of problems for county road projects. This group supervises the programming, preparation of plans and all details pertinent to the awarding of contracts for county projects on which Federal-aid moneys are used. Supervision of construction is then the responsibility of the personnel of the District Office in which District the project is located. The Highway Department does not participate or assume responsibility for county highway construction other than those projects on which Federal-aid is applied. Under the regulations of the Federal Bureau of Public Roads such Federal matching money can only be expended under the supervision of the State Highway Department as these regulations recognize only the State Highway Departments of the several States in such matters. As contained in this report it is pointed out that county road commissions are entitled to the privilege of matching on a 50-50 basis within one year after allocation, an amount of Federal-aid up to half of that allocated each year by the Federal Government to the State of Indiana for the Federal-aid Secondary System. The assistance of the County Federal-Aid Section of the State Highway Department has made it possible for counties to avail themselves of Federal-aid money to a much greater extent than was feasible prior to the existence of this coordinating section.

Materials

Into the upkeep of the Indiana highways a great variety of materials must be used. Such materials as bituminous oils, asphalt, mineral aggregates, concrete, etc., for road surface repair; paints, glass beads for reflectorizing purposes; guard rail materials; chemicals for weed control and associated items are essential to centerline striping and roadside maintenance. Adequate garage facilities require furnaces and electrical wiring maintenance, fuel for heating and related materials necessary to proper facility upkeep; expendable repair parts and small tools are necessary to the maintenance operations. All of these materials and many more are bought by the State of Indiana on open bids for which detailed specifications are drawn. During the last fiscal year these supplies, together with the wages and salaries of maintenance employees who used these materials in maintaining the State highways of Indiana encumbered $22,922,830.00. Some $5,000,000.00 of this amount was spent in highway ice control and snow removal during the winter season including about $2,000,000.00 for the purchase of salt, chlorides and other abrasives to make highways safe for travel during winter traffic periods.

Immediate Future Considerations

A Glimpse of How the Next Two Year Program May Look to You

In conformity with the 1959 statutes of the General Assembly of the State of Indiana the State Highway Department is completing the development of a 2-year program effective June 30, 1960.

In the development of the program the use of the sufficiency rating principle is being applied within practical limits. A balanced program within the 6 Districts of the State Highway Department is essential to a proper statewide distribution of available funds. The relative urgency of improvements, based on a consideration of the physical condition and safety and service characteristics of the highways within each District, is being used in the determination of priority of the program projects.

A further division of the allocation of funds, within the Districts, is necessary to the proper matching of the several categories of Federal funds made available to the State on a matching basis, as Federal-aid for highways.

Having in mind the criteria as mentioned herein the recommended 2-year program beginning July 1, 1960 is described briefly in the following paragraphs. These descriptive paragraphs of the recommended program are intended to point up certain important parts thereof as inclusive therein, but not detailed description or limited to such items. Proper balancing of estimated costs against available funds in each of the categories is necessary to the final production of the program together with a final review of the controlling factors establishing the needs priority for the many items that will be described in detail when the program preparation is complete.

INTERSTATE

Consistent with the above, the 2-year program beginning July 1, 1960 anticipated for the Interstate System the continuation of Interstate 65 to a connection with US 31 at Taylorsville south of Indianapolis where it will join the present 4-lane divided US 31 route.

It further contemplates the continuation of construction of the west and south bypass route of Interstate 465 around Indianapolis together with the start of construction of certain Interstate Route connections leading into the business district of the City of Indianapolis.

Also included is the extension of Interstate 70 from Centerville westerly towards a connection with SR 1 and the continuation of the construction of this route around Terre Haute to a temporary connection with US 41 easterly thereof.

The start of construction of Interstate 74 from the Ohio line northwesterly and the continuation of this route from Shelbyville southeasterly towards Greensburg as well as the completion of the construction of this route between Indianapolis and the Illinois State line are important parts of the 2-year program.

Likewise the continuation of Interstate 80 (Tri-State) easterly from SR 53 (Broadway) to the Lake-Porter County line involving the intersection with the Indiana Toll Road is contemplated.

Continuation of work on Interstate 69 in the Fort Wayne area is expected to be a part of this program.

Included as a part of the Interstate construction and consistent with an agreement with the State of Kentucky it is expected to include the construction of a bridge across the Ohio River on Interstate 65 between Jeffersonville, Indiana, and Louisville, Kentucky, together with the necessary approach construction that will make this structure available for public use.

Likewise the construction of the Indiana approach to the Ohio River bridge at New Albany will be continued to such extent as to connect with existing State routes in that area.

It is estimated that the Federal funds available for this program will amount to approximately $103,000,000.00 for the 2-year period and the corresponding State funds for matching purposes will amount to approximately $11,000,000.00.

PRIMARY

The program for the Primary Federal-aid System includes an estimated Federal allocation of approximately $16,200,000.00 which will be matched by the State Highway Department on a 50-50 basis making a total of $32,400,000.00.

This program includes the continuation of the 4-lane improvement of US 30 from Fort Wayne west, further improvements of US 31 to a 4-lane divided facility between Indianapolis and South Bend, continuation of the bypass of US 20 on the west and south of South Bend, further improvements on SR 36 west of Indianapolis, further improvements of US 41 south of Hammond, improvements of SR 63 in the vicinity of Terre Haute, improvements on US 50 in the Vincennes area and in the area of Aurora.

All of the above are descriptive of the program which must be itemized and which will include additional projects insofar as the balance of funds in this category will permit.

SECONDARY

The program for the Secondary Federal-aid System likewise will include many items of high priority needs such as reconstruction of SR 3 in the vicinity of Fort Wayne, certain improvements of SR 9 including road and bridge reconstruction in the vicinity of Albion and US 6 road and bridge improvements, improvements on SR 129 and SR 135, all of which are being itemized along with many other projects of high priority need in the balancing of anticipated available funds with estimated costs and a fair distribution of such work throughout the State.

Total Federal-aid for the 2-year period is estimated to amount to $13,100,000.00 for the Federal-aid Secondary System. However, the county road commissions have one year after the date of authorization of each annual allocation of Federal funds in which to apply for the use of such funds on the county Federal-aid system to the extent of half of the Federal-aid moneys available for this category. Therefore the estimated program on the Federal-aid Secondary Road System as included in the system of State highways under the jurisdiction of the State Highway Department is estimated to amount to $17,200,000.00 for the 2-year period.

The County Secondary Road System as coming under the jurisdiction of the State Highway Department is described further under the heading of "Federal-aid County Road System" in a later part of this report.

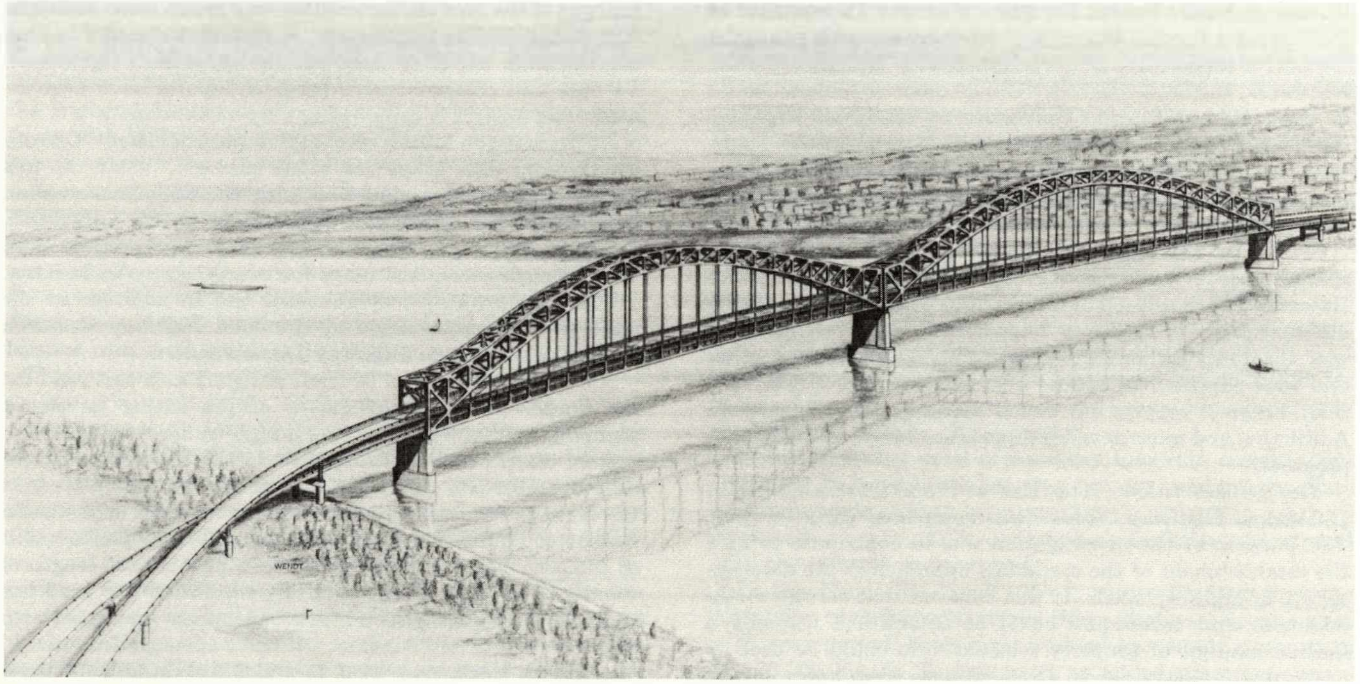
URBAN

The estimated funds available for the 2-year program aforementioned for urban construction on the Federal-aid System is approximately $22,000,000.00. The program will include many items of high priority need too numerous to recite at this time and subject, of course, as in the other categories, to a balancing of the available funds against the detailed estimated costs after a more thorough study has been completed, prior to the announcement of the program.

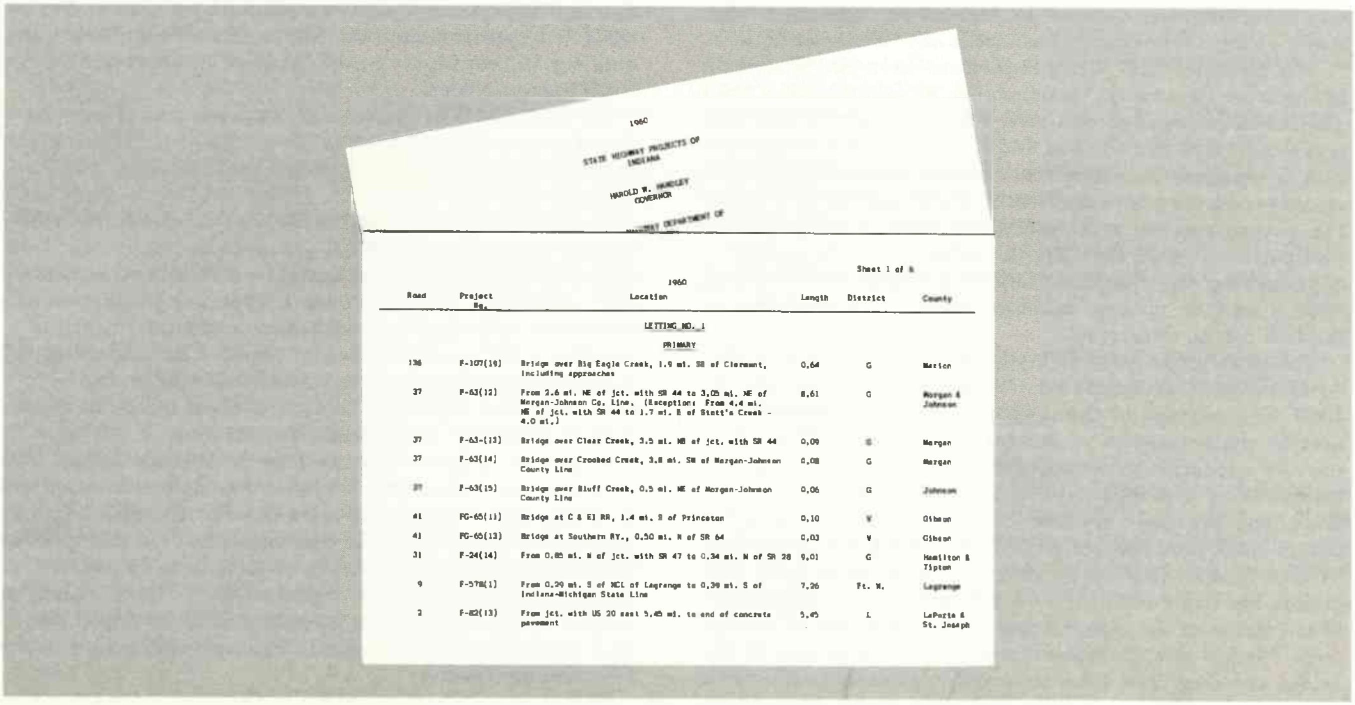
Such items might be continuation of the bypass at South Bend, within the urban area, the possible improvement in Michigan City, certain State Road improvements in the urban Indianapolis area including continuation of the improvement of SR 431 and other high priority projects in the area. Likewise it is expected that the program will include certain new construction in the urban area of Evansville, New Albany and Vincennes. Priority consideration is also a matter of further study in the Fort Wayne area having to do with US 427, SR 3 and other needed improvements.

There are high priority projects in the Calumet area that will receive consideration in the final development by items of the 2-year program.

These are but indications of needs in the larger communities, bearing in mind that many smaller communities falling within the urban classification have deficiencies in the State Road System within their boundaries that must be rated as to the relative importance of their needs in preparing the 2-year program balance.



Interstate Bridge under construction crossing the Ohio River between New Albany, Indiana and Louisville, Kentucky on Interstate Route 64.



1960

STATE HIGHWAY PROJECTS OF
INDIANA

HAROLD W. HANDLEY
GOVERNOR

HIGHWAY DEPARTMENT OF

Sheet 1 of 6

1960

Road	Project No.	Location	Length	District	County
		LETTING NO. 1			
		PRIMARY			
136	F-107(19)	Bridge over Big Eagle Creek, 1.9 mi. SE of Clermont, including approaches	0.64	G	Marion
37	F-63(12)	From 2.6 mi. NE of jct. with SR 44 to 3.05 mi. NE of Morgan-Johnson Co. Line. (Exception: From 4.4 mi. NE of jct. with SR 44 to 1.7 mi. E of Stott's Creek - 4.0 mi.)	8.61	G	Morgan & Johnson
37	F-63-(13)	Bridge over Clear Creek, 3.5 mi. NE of jct. with SR 44	0.09	G	Morgan
37	F-63(14)	Bridge over Crooked Creek, 3.8 mi. SW of Morgan-Johnson County Line	0.08	G	Morgan
37	F-63(15)	Bridge over Bluff Creek, 0.5 mi. NE of Morgan-Johnson County Line	0.06	G	Johnson
41	FG-65(11)	Bridge at C & EI RR, 1.4 mi. S of Princeton	0.10	V	Gibson
41	FG-65(13)	Bridge at Southern RY., 0.50 mi. N of SR 64	0.03	V	Gibson
31	F-24(14)	From 0.85 mi. N of jct. with SR 47 to 0.34 mi. N of SR 28	9.01	G	Hamilton & Tipton
9	F-57B(1)	From 0.29 mi. S of NCL of Lagrange to 0.39 mi. S of Indiana-Michigan State Line	7.26	Ft. W.	Lagrange
2	F-82(13)	From jct. with US 20 east 5.45 mi. to end of concrete pavement	5.45	L	LaPorte & St. Joseph

TYPICAL PROJECT PROGRAMMING

RESEARCH

The Key to Current and Future Highway Development

Early in the year of 1958 an agreement was reached by the Bureau of Public Roads, the State Highway Department of Indiana, and Purdue University, whereby research or special studies for cooperative projects between the Bureau of Public Roads and the State Highway Department of Indiana, could be conducted at Purdue University by the Joint Highway Research Project. These cooperative projects utilize Highway Planning Survey funds and are the responsibility of the State Highway Department which funds are approximately 75% Federal.

Soon after the agreement had been reached, three such special projects were started at Purdue by the Joint Highway Research Project. Each of the projects dealt with an entirely different phase of Highway Engineering. One of the projects was scheduled for an early completion date while the other two were expected to extend over a three year or more period. Progress reports are issued monthly on each project. Additional and more detailed reports are issued as the studies progress.

The project titled "The Use of Statistical Sampling to Determine Highway Needs" was completed early in 1959. The purpose of the investigation was to contribute toward the establishment of the statistical approach in the determination of highway needs. It was believed that certain methodologies and techniques could be established whereby a limited amount of properly selected data could be used to determine highway needs. Detailed data from two midwest States was used as a basis for the statistical analysis of the study. From these data simple random sampling, stratified random sampling, simple cluster sampling and stratified cluster sampling were investigated. Because of the complex arithmetic involved in the statistical method and the numerous bits of data required, the problem was programmed and the mathematics solved by high-speed computers. This study yielded very useful conclusions and recommendations.

The project titled "Measurement of Moisture Gradients in Concrete Pavements" is scheduled for completion in April 1961. The purpose of this study is to develop a practical non-destructive test method and the necessary instrumentation to measure moisture gradients in hardened portland-cement concrete under non-steady state conditions. To date the nuclear method and capacitance method are under investigation. To date there appears to be very little possibility of measuring the moisture gradient in a concrete pavement with a surface nuclear moisture meter. The Capacitance method can be developed.

The third project titled "Hydraulics of River Flow Under Arch Bridges" is scheduled for completion December 31, 1960. The purpose of the investigation is to study the hydraulic characteristics of stream flow under arch bridges, provide a criterion to determine the proper clear span of arch bridges so as to compensate for the loss in efficiency at high flows, and provide a method for computing the backwater upstream of arch bridges. Hydraulic models are being used in this study. Small-scale one, two and three-span arch bridges are being built for several span to rise ratios. Effects of the shape of the channel and of the skew will be considered. Models permit measurement of the head loss at the bridge crossing, flow velocities, and backwater profile for a number of bridge geometrics and river flows. In order to produce all flow conditions that may exist, it was necessary to build the bridge models on a tilting flume. A dimensional analysis of the flow characteristics may group these variables into dimensionless parameters. A systematic model testing may indicate which of these parameters is most significant. To date two comprehensive progress reports have been issued. The project is progressing very satisfactorily.

At present the fourth cooperative project titled "County Engineering Soil Maps" is being planned. Work on this project will be in conjunction with the Soil Conservation Service and the Agronomy Department of the Agriculture Experiment Station, Purdue University. The purpose is to develop engineering soil maps for every county in Indiana.

The four projects just described are in addition to the research and studies made by the Joint Highway Research Project for the State Highway Department.

Another experimental project, designed as a test road for the purpose of studying means of preventing pavement pumping on highways carrying a high traffic volume with a normal distribution of heavy axle loads, was ten years old on November 11, 1959. The test road was constructed on US 41, in Lake County, as a cooperative project between the Bureau of Public Roads and the State Highway Department of Indiana. The experimental sections have a total length of 4 miles. Each mile of the carefully controlled test road has eight subbase sections; (1) two soil-cement mixtures with thicknesses of 3 and 5 inches; (2) three open-graded crushed stone, with thicknesses of 3, 5, and 8 inches; and (3) three of dense-graded crushed stone, with thicknesses of 3, 5, and 8 inches. The ninth section in each mile was designated as a control section with the concrete pavement placed directly on the fine-grained soil. The first and third miles have plain concrete with contraction joints spaced 15 feet. The second and fourth miles have contraction joints spaced 40 feet. During the past year we have continued our yearly observations and measurements on this project. We are now planning our 10 year report on the project. Two previous reports have been published.

During 1959 The Bureau of Materials and Tests established a new laboratory for the purpose of studying and testing bituminous mix designs and for special soil mechanics testing.

To date the bituminous testing has centered around the Hveem Method. Some of the special equipment required for this testing includes 3 mechanical convection, thermostatically controlled, electric ovens, a kneading compactor, stabilometer, cohesiometer and testing machine.

Some of the special equipment required for soil testing will include consolidometer, shear and other equipment.

Testing that will apply to both of these materials will include triaxial and unconfined compression.

Since the same testing machine is utilized to test both materials it was necessary to select a highly versatile and accurate unit. Accordingly a three screw machine having a capacity of 60,000 pounds was selected. This machine has five scale ranges and can weigh accurately to ½ pound. The weighing accuracy is accomplished by a lever balancing system utilizing electronic recording. It is equipped with a high magnification stress-strain recorder and a load holder for precision testing.

The above projects are some of the more interesting ones within the particular area of Research.

Future Highway Needs

The Problem of Planning for an Expanding Hoosier Economy

Consistent with the accelerated program of highway improvements and immediate future program developments the Highway Department is proceeding with a study having to do with its long-range program. Such a program must be consistent with the estimated finances that will be available.

In a joint undertaking with Purdue University a study of highway transportation needs in Indiana was prepared in 1955. In the preparation of this study of highway needs the appraisal thereof was made separately for the State Highway System as differentiated from county highway and city street deficiencies. A mile by mile inventory of the State Highway System was performed in the winter and spring of 1955 affiliating such information as type and condition of road surface; type, condition, thickness of surface; type of soil; age of pavement; sight distance; and degree of curvature for each section of highway. Complete information on bridges and railroad crossings was also compiled and this entire data punched on IBM cards to permit rapid and accurate tabulation and computation. Information as to highway capacities, accident rates, traffic and structural characteristics and remaining surface life was determined. Amortizing of the important geometric and structural elements of the highway in relation to present and future traffic requirements was then accomplished. The sum of the needed improvements for all sections of highway, both urban and rural were then summed up into the total needs for the State Primary, Secondary and Urban System. To this was added the requirements of the Interstate System as determined from a detailed analysis of data prepared by the State Highway Department in accordance with the requirements of the Federal-aid Highway Act of 1944. The costs of eliminating these deficiencies were separated into that of immediate needs and that which it was estimated would exist by 1970.

The Planning Division of the State Highway Department is now in the process of up-grading these deficiencies to arrive at a current status thereof, taking into account those that have been completely or partially eliminated during the past five years of improvements. The rapid changes in traffic demands that have occurred since the needs study was prepared have precipitated the need for studies as to future locations, as a part of the means of correcting existing deficiencies.

Cooperative effort is essential on the part of long-range planning wherein consideration is properly given to the development problems of local governmental agencies. An Urban Planning Section in the Planning Division has been established to cooperate with local governmental agencies and planning commissions in areas of complex development problems. Local planning agencies are encouraged to work with the Department and in instances where such agencies are lacking, a bi-partisan committee appointed by the Governor has and is being of great benefit in establishing proper priority of improvement. Current deficiencies in grade, alignment, roadway widths, structural composition of highway surface, shoulder widths and structural deficiencies thereof, drainage deficiencies and other items essential to the safety and service of the traveling public are further aggravated by the consideration of expanded traffic needs of the future.

The problem of future planning is recognized as one of continual change wherein new developments, urban expansions and newly created transportation needs must be recognized to the fullest possible extent in order that locations as well as improved geometrics of existing facilities may be economically accomplished to the best public benefit.

The State Road System amounts in miles to only about 10% of the total public road mileage in the State but it must be so improved and located as to become the collectors for the vast system of feeder roads that comprise the county road system and the city streets.

Future planning must of necessity take into account continuity of improvements between terminal and intermediate terminal points so that as improvements are continued thru-consecutive years public use of these facilities will expand with the mileage so improved.

In the Needs Study of 1955 it was estimated that the correction of deficiencies in the State Highway System over a 15 year period, both rural and urban, should amount to $1,120,000,000.00. To this must be added the approximate cost of completing the insterstate system in Indiana, of $850,000,000.00.

It is reasonably safe to assume that the expenditures since that time for highway improvements have little more than kept pace with the increased deficiencies that have resulted from the rapid expansion in miles of motor vehicle travel and motor vehicle registrations. The work of the Planning Division must therefore proceed with flexibility and with a broad realization that it is an ever continuing subject of study and evaluation.

Presently it is estimated that by 1970, the elimination of recognized deficiencies will involve the construction or reconstruction, using the 1955 deficiency report as the base, of:

1170 Miles of 2 lane highways
1150 Miles of 4 lane highways
2600 Miles of widening and resurfacing
200 Miles (approx.) new urban construction, including bypasses.
1020 Structures

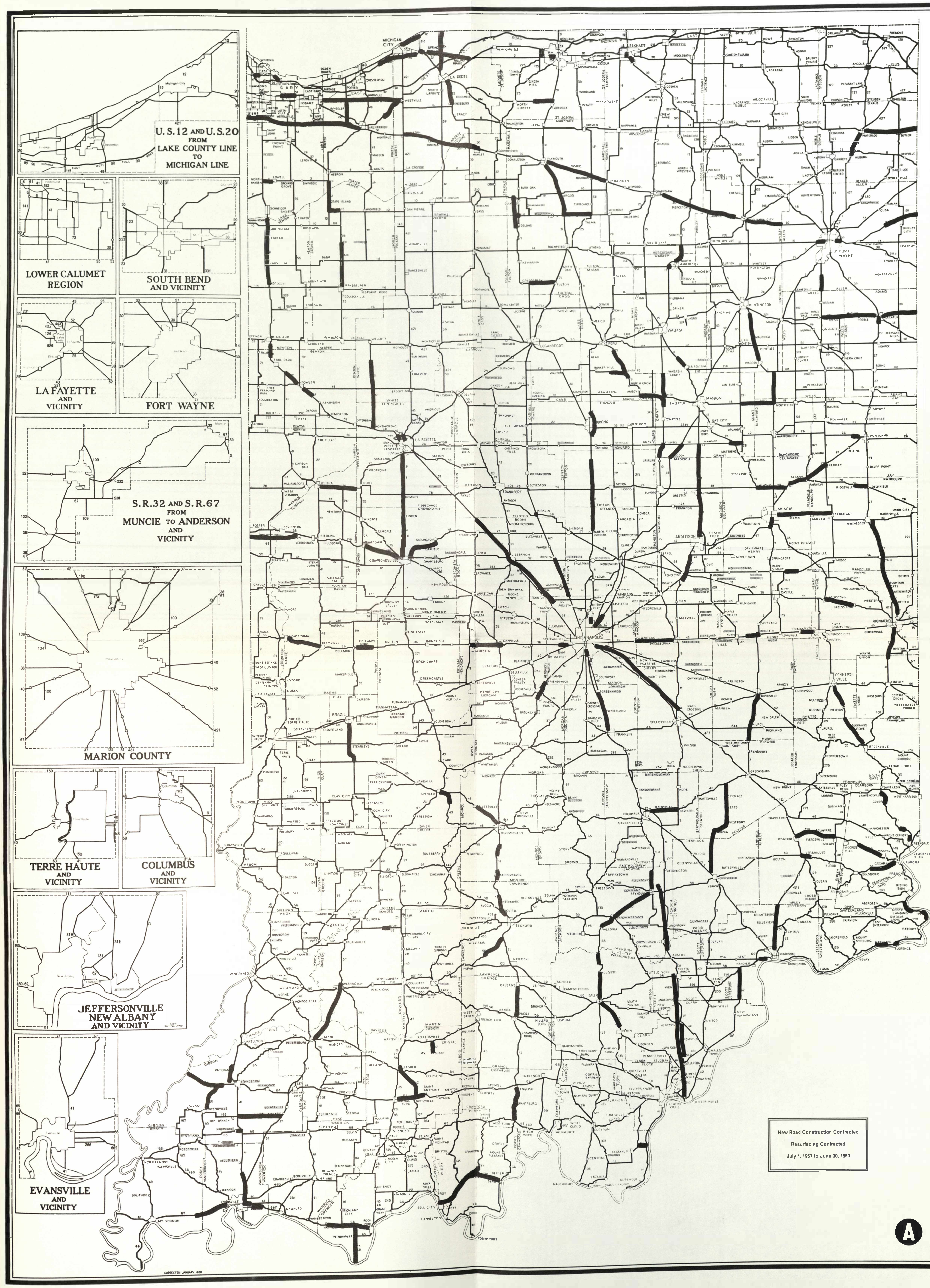
The extent to which this can be accomplished depends upon available finances. Presently, the best projected estimate of finances for such purposes are,

$300,000,000 State
$896,000,000 Federal (see categories)

Priority of this work according to extent of deficiencies will result in the most economical expenditure of highway funds and eliminates this old philosophy of "the wheel that squeaks the loudest gets the grease." Unforseen and unexpected emergencies will always be a problem and must always be taken into account.

INDEX TO MAPS

A. New Construction—July 1, 1957-June 30, 1959
B. Bridges Constructed or Widened—July 1, 1957-June 30, 1959
C. Highway Maintenance—July 1, 1957-July 1, 1959
D. New Highway Construction—July 1, 1959-June 30, 1960
E. Bridges Constructed or Widened—July 1, 1959-June 30, 1960
F. Highway Maintenance—July 1, 1959-June 30, 1960
G. County Federal Aid Program—July 1, 1957-June 30, 1959
H. County Federal Aid Program—July 1, 1959-June 30, 1960


U.S.12 AND U.S.20 FROM LAKE COUNTY LINE TO MICHIGAN LINE
LOWER CALUMET REGION
SOUTH BEND AND VICINITY
LA FAYETTE AND VICINITY
FORT WAYNE
S.R.32 AND S.R.67 FROM MUNCIE TO ANDERSON AND VICINITY
MARION COUNTY
TERRE HAUTE AND VICINITY
COLUMBUS AND VICINITY
JEFFERSONVILLE NEW ALBANY AND VICINITY
EVANSVILLE AND VICINITY
New Road Construction Contracted
Resurfacing Contracted
July 1, 1957 to June 30, 1959
CORRECTED JANUARY 1960
INDIANAPOLIS
FORT WAYNE
SOUTH BEND
GARY
MICHIGAN CITY
LA PORTE
ELKHART
LA FAYETTE
LOGANSPORT
KOKOMO
MARION
MUNCIE
ANDERSON
RICHMOND
TERRE HAUTE
VINCENNES
EVANSVILLE
BLOOMINGTON
COLUMBUS
MADISON
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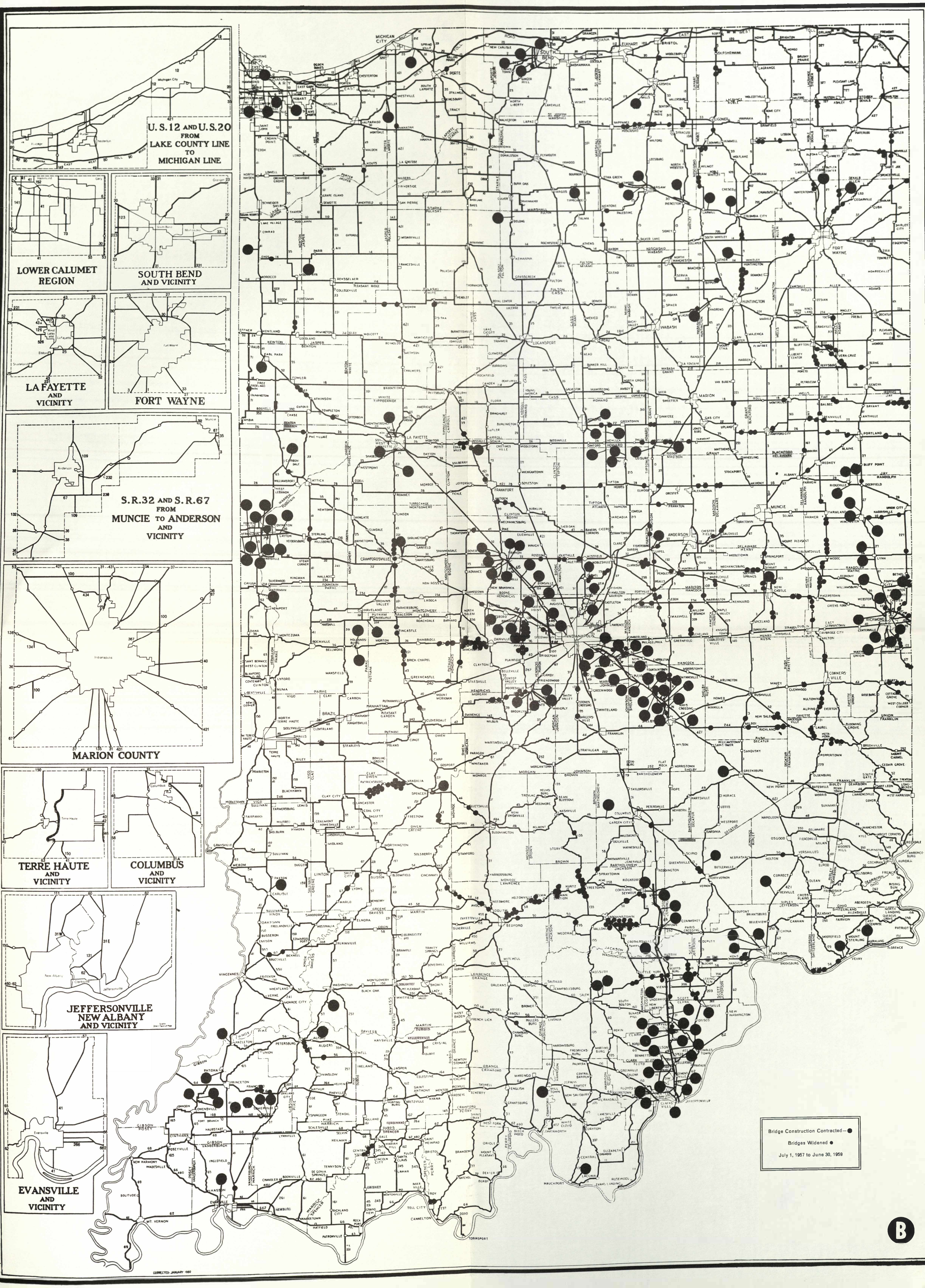
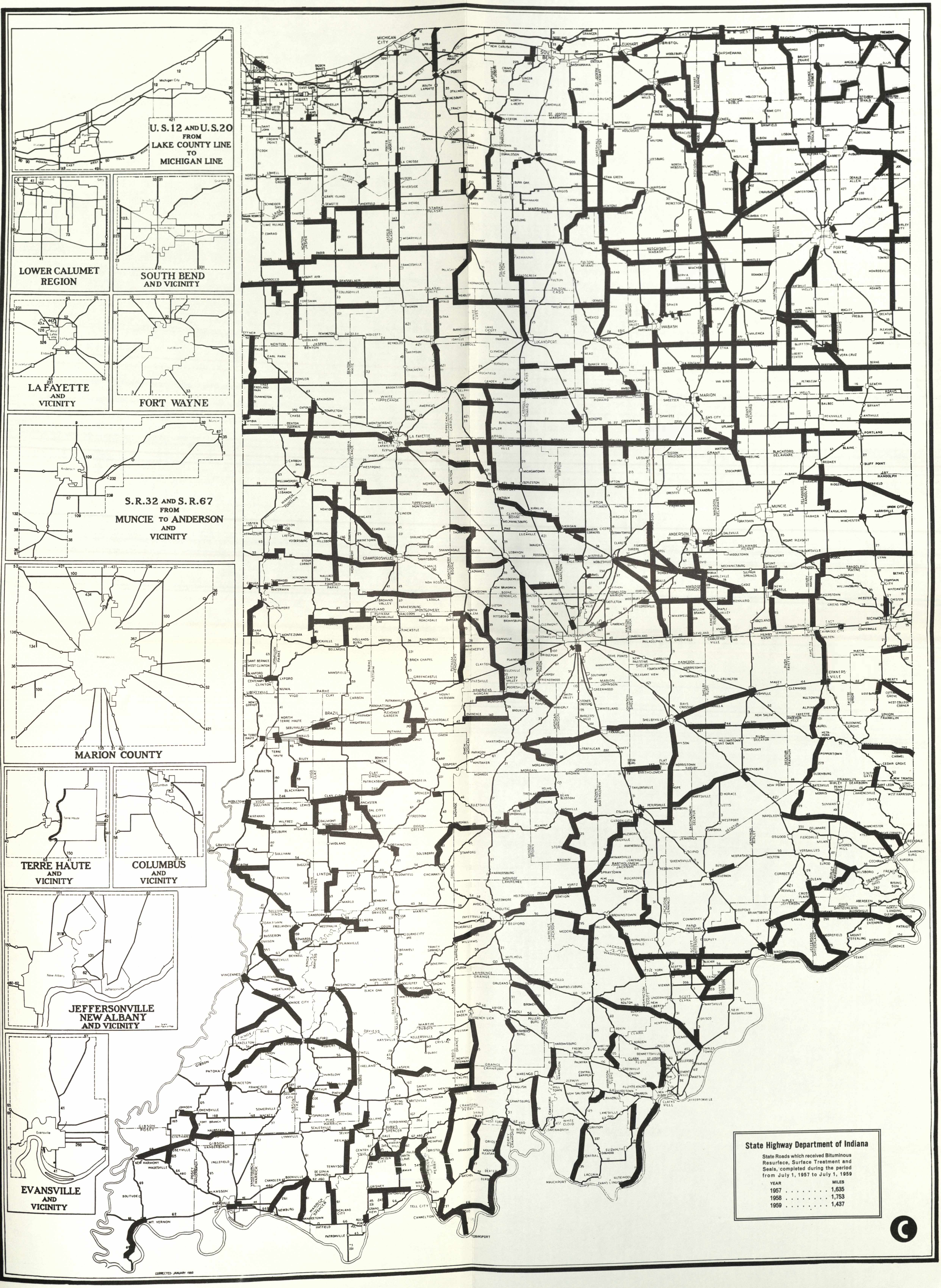


Bridge Construction Contracted — ●

Bridges Widened ●

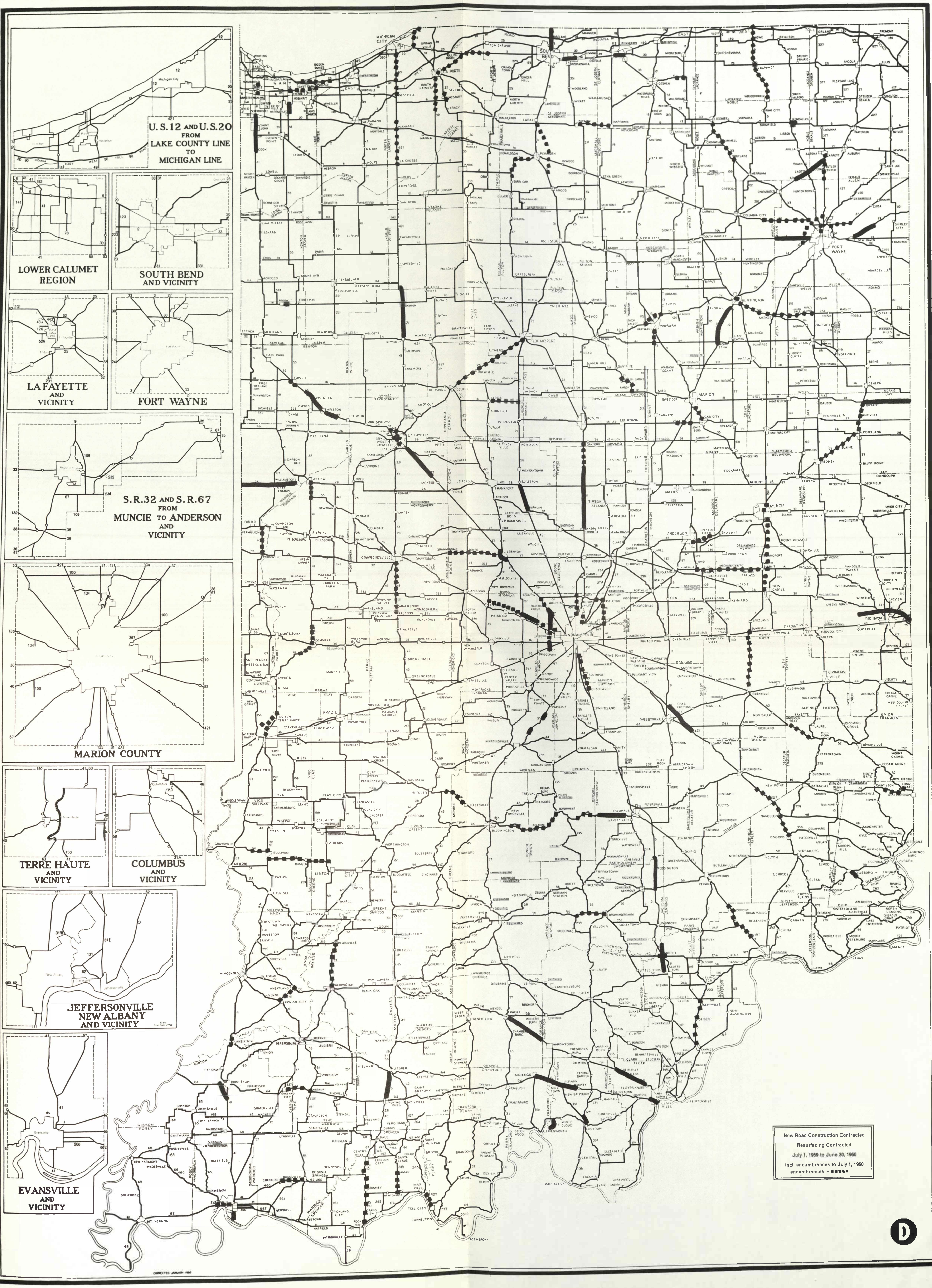
July 1, 1957 to June 30, 1959



State Highway Department of Indiana

State Roads which received Bituminous Resurface, Surface Treatment and Seals, completed during the period from July 1, 1957 to July 1, 1959

YEAR	MILES
1957	1,635
1958	1,753
1959	1,437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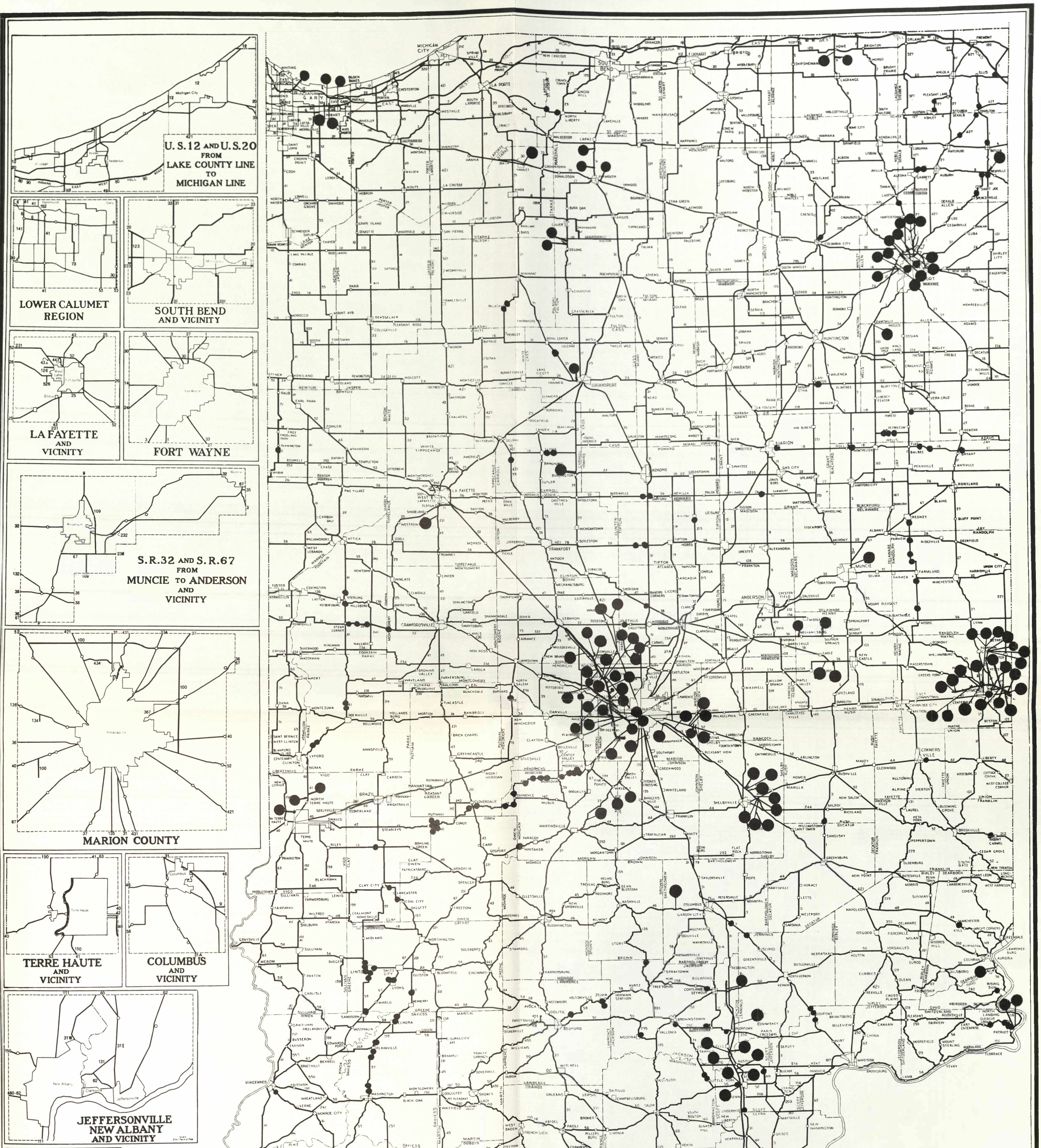
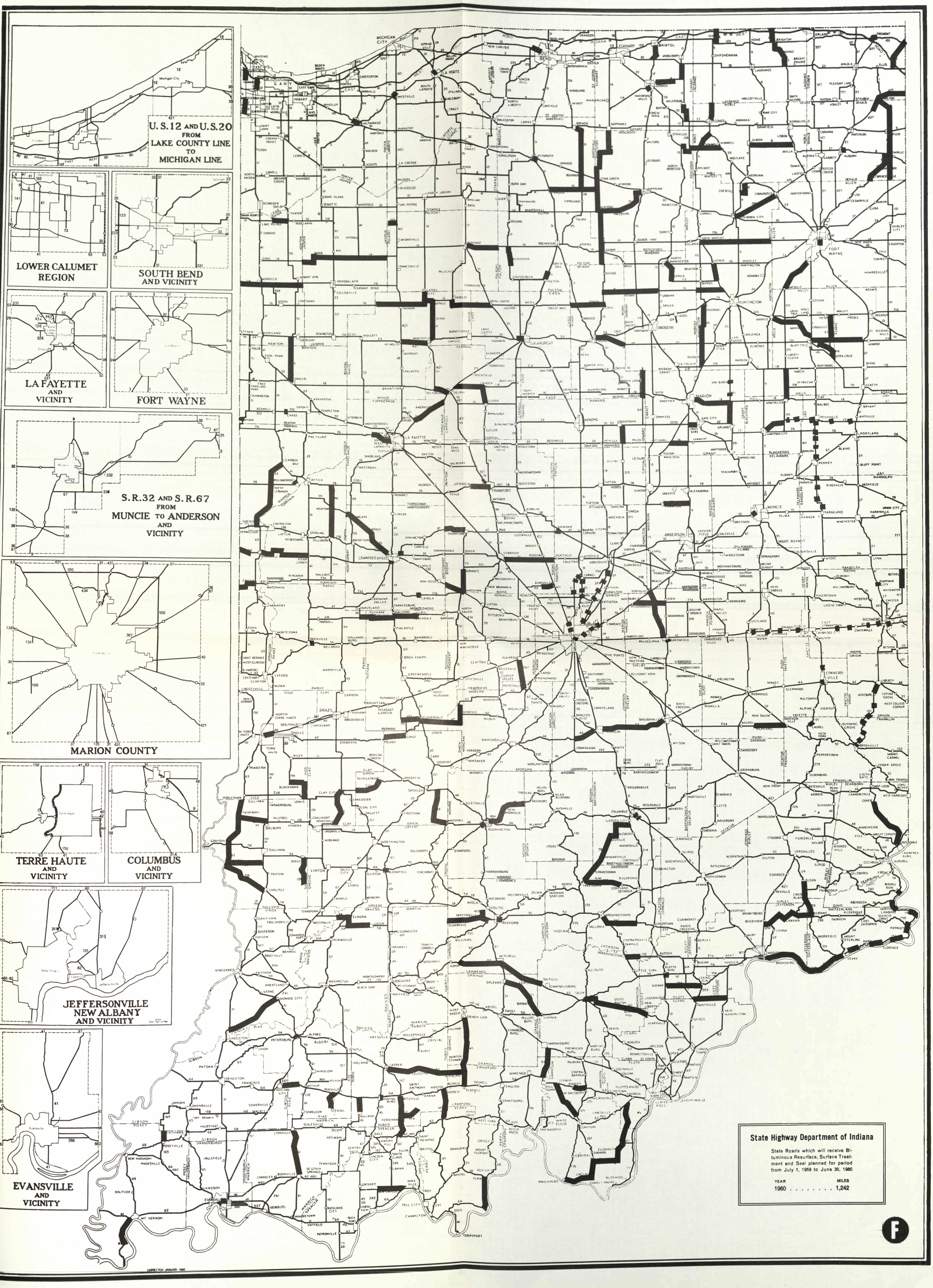
New Road Construction Contracted
Resurfacing Contracted
July 1, 1959 to June 30, 1960
Incl. encumbrances to July 1, 1960
encumbrances - ■■■■■
CORRECTED JANUARY 1960
D



Bridge Construction Contracted — ●
Bridges Widened ●
July 1, 1959 to June 30, 1960
incl. encumbrances to July 1, 1960

CORRECTED JANUARY 1960

E



State Highway Department of Indiana

State Roads which will receive Bituminous Resurface, Surface Treatment and Seal planned for period from July 1, 1959 to June 30, 1960

YEAR	MILES
1960	1,242

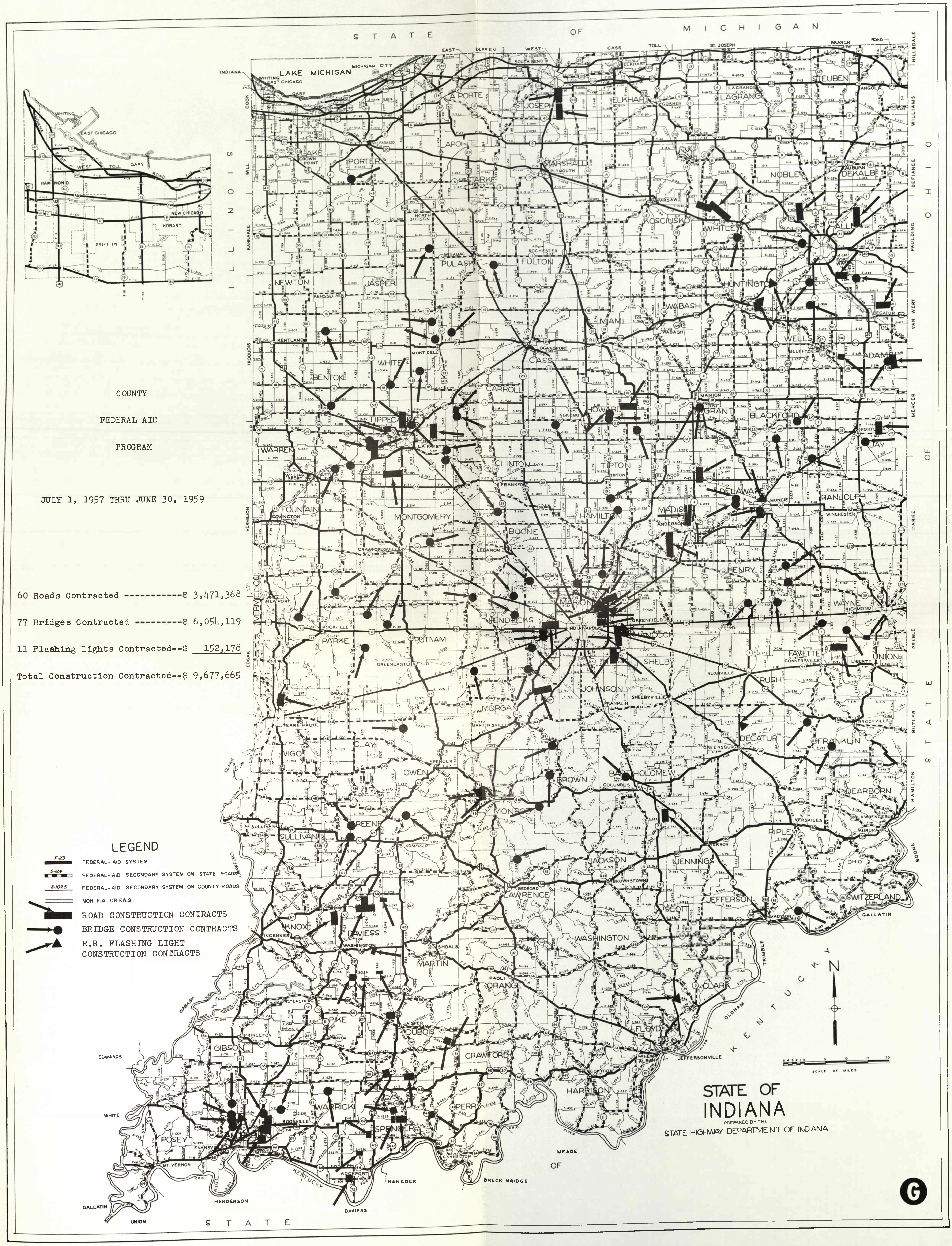
COUNTY

FEDERAL AID

PROGRAM

JULY 1, 1957 THRU JUNE 30, 1959

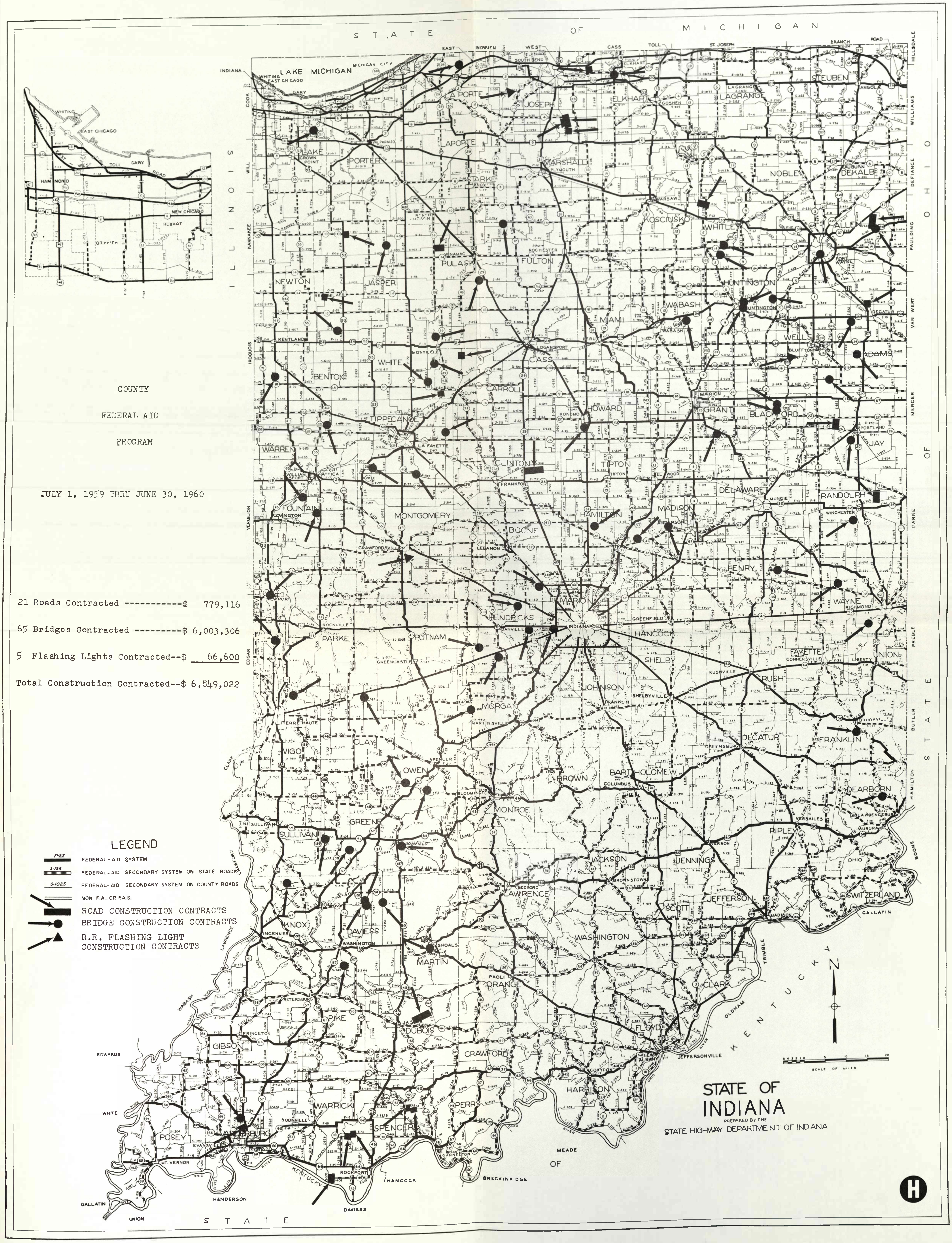
60 Roads Contracted -----------	$ 3,471,368
77 Bridges Contracted ---------	$ 6,054,119
11 Flashing Lights Contracted--	$ 152,178
Total Construction Contracted--	$ 9,677,665


STATE OF MICHIGAN
LAKE MICHIGAN
ILLINOIS
OHIO
STATE OF KENTUCKY
LEGEND
F-23 FEDERAL-AID SYSTEM
S-124 FEDERAL-AID SECONDARY SYSTEM ON STATE ROADS
S-1025 FEDERAL-AID SECONDARY SYSTEM ON COUNTY ROADS
NON F.A. OR F.A.S.
ROAD CONSTRUCTION CONTRACTS
BRIDGE CONSTRUCTION CONTRACTS
R.R. FLASHING LIGHT CONSTRUCTION CONTRACTS
SCALE OF MILES
N

STATE OF INDIANA

PREPARED BY THE
STATE HIGHWAY DEPARTMENT OF INDIANA

G



COUNTY

FEDERAL AID

PROGRAM

JULY 1, 1959 THRU JUNE 30, 1960

21 Roads Contracted -----------$	779,116
65 Bridges Contracted ---------$	6,003,306
5 Flashing Lights Contracted--$	66,600
Total Construction Contracted--$	6,849,022

GEORGE M. FOSTER
Executive Director

CARL E. VOGELGESANG
Chief Engineer

INDEX

A Note to the Highway Users of Indiana 2
A Letter from the Commissioner 3
Highway Department Organization Chart 4
Income and Expenditure 5
Indiana Highway Improvements (map) 6
Indiana's Biggest Business 7
Indiana Bridge Program 8
Indiana Road Program 9
Interstate Progress Map 10
Interstate Report 11
How We Build Roads and Bridges
  Photogrammetry 12
  Planning Division Accomplishments . . . . 13 & 14
  Right of Way Division 15
  Systems of Hoosier Highways 17
Division of Maintenance 18
Accomplishments of the Traffic Division . . . 19 & 20
Miscellaneous 21
Immediate Future Considerations . . . . 22 & 23
Research 24
Future Highway Needs 25

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